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TRUTH ABOUT INTRASPINAL INJECTIONS IN TREATMENT OF SYPHILIS OF NERVOUS SYSTEM *

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Intraspinal injections of salvarsanized serum or serum plus salvarsan in the treatment of syphilis of the nervous system is a form of antisyphilitic medication which has exercised a curious fascination over the medical man during the past few years and has gained a large number of adherents among the general medical public. This was due, first, to its very respectable parentage, and secondly, to the fact that nothing was hailed with greater satisfaction than the prospect of striking at the very root of serious disease by injecting the remedy directly into the spinal canal in almost immediate proximity to the chief seat of trouble. I was one of the earliest victims of this fascinating belief, and at the International Congress in London, stated frankly that I thought this newer method of antisyphilitic medication promised better results than anything else that had heretofore been suggested. The large experience of later years has convinced me and my associates, Drs. Strauss and Kaliski, that the hopes placed on this intraspinal method were unwarranted, and that it has achieved nothing that cannot be obtained by the intravenous method.

The present-day aim of specific therapy is to bring the spirocheticidal remedy, if possible, into immediate contact with the foci of disease in the tissues of the brain, the spinal cord and their coverings. It so happens that in general paresis the spirochetes, as Noguchi has shown, are inserted in the gray matter of the cortex at some distance from the surface, and that in tabes dorsalis, excepting in the very earliest stages, syphilitic disease has brought about marked degenerative changes in the spinal cord which we could hardly expect to be affected by any remedy in whatever way it may have been introduced. There remain, however, a considerable number of specific meningo-encephalitic and meningomyelitic processes, truly exudative in character, which could be reached readily enough by intraspinal medication if such remedies were allowed to course freely in the cerebrospinal fluid, and if it could be shown that they were retained in this fluid for any satisfactory period of time.

My clinical experience had taught me some years ago that the intravenous injection of salvarsan or neosalvarsan produced results that were entirely satisfactory and that were at least comparable with those obtained by intraspinal medication. Other things being equal, the intravenous method is much the safer and for that reason alone would have been preferable, for in hundreds of intravenous injections I have not had a single unfavorable experience so far as life is concerned, whereas no one who has had much experience with the intraspinal form will deny that often enough serious results follow on this form of medication, and that even if life is not actually in danger, as it sometimes is, paralyses and serious vesical disturbances often ensue. The claims made for the superiority of the intravenous over the intraspinal method would, however, remain unsatisfactory unless some substantial explanation could be given for failure of the intraspinal method to accomplish more than its rival. Three years ago, in a research in which I took part in association with Drs. Strauss and Kaliski, and with the assistance of as able a chemist as Professor Benedict, it was shown that salvarsan introduced in the usual quantities into the blood current actually appeared in the cerebrospinal fluid in appreciable quantities. The older doctrine, therefore, that the choroid plexus is impermeable and that salvarsan introduced intravenously cannot be expected to reach the cerebral or spinal tissues had to be abandoned.

In view of these findings, the question arose whether after intraspinal medication the infinitesimal amount of salvarsan that could be introduced with safety directly into the canal was any greater than the amount which would naturally reach the cerebrospinal canal after the antecedent intravenous injection. Later on it was suggested that instead of using the patient's serum withdrawn after intravenous injection, salvarsan or neosalvarsan be added to the blood serum and injected into the spinal canal by lumbar puncture. Rational as such procedures may appear to be, they were entirely discredited by subsequent studies on the functions and behavior of the cerebrospinal fluid.

The important facts that have come to our knowledge are, first of all, as Weed has pointed out, that, since pressure in the cerebral capillaries is considerably higher than the cerebrospinal tension, it is far more likely that fluid leaves the cerebral capillaries, and circulates in the pericapillary and perineuronal spaces, yielding nourishment and receiving waste products and finally leaving the tissues by the pericapillary and perivascular spaces to the subarachnoid cavities over the surface, whence absorption into the venous sinuses takes place.

It is evident, therefore, that a metallic substance like salvarsan introduced into the spinal canal does not remain in the cerebrospinal fluid for any length of time, but is rapidly absorbed into the venous system.

* Chairman's address, read before the Section on Nervous and Mental Diseases at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

Secondly, it has been shown that the cerebrospinal fluid circulates very imperfectly and that the natural course of this fluid is not favorable to the absorption of substances from the cerebrospinal fluid by the cells of the cortex. It is by no means certain, therefore, that substances introduced into the lumbar region would be brought into immediate and repeated contact, even if retained, with foci of disease within the tissues of the brain or cord. Naturally enough, the question would be more readily solved if less toxic substances than salvarsan, or salvarsan in larger quantities, could be introduced. As Halliburton properly puts it, "The use of salvarsan in locomotor ataxia and similar late syphilitic affections, via the cerebrospinal fluid, has been abandoned, as it is fatal not only to the syphilitic organisms, but also to the patient."

It is further known that salvarsan and its homologues are of little or no use in tabes dorsalis and general paresis when it is given by the ordinary channels, for in these later manifestations of syphilis the baneful spirochete has entered into the harbor of refuge, which we may speak of as extravascular, beyond the reach of the poison. All recent physiologic experiments would go to show that metallic substances introduced into the cerebrospinal fluid are not retained, but passed into the venous system, and, furthermore, that certain substances coursing in the blood may pass through the choroid plexus into the cerebrospinal fluid by way of the capillary vessels. If such substances are compelled to take this circuitous route, it would be far better to trust more implicitly to the blood stream and to endeavor to discover remedies which will pass easily and positively from the blood vessels into the brain substance. As MacIntosh and Fildes assert, correctly enough, the present-day remedies are to some extent inefficient in the treatment of syphilis of the central nervous system because they do not possess the necessary solubility to allow them to pass through the blood vessels into the brain substance.

Some of the ardent advocates of the intraspinal method are beginning to see the light; and since they have acknowledged, as Amoss did recently, that the virus in poliomyelitis within the brain and spinal cord cannot be reached by intraspinal treatment alone, they will also be compelled to concede that what is true of the poliomyelitic virus must also be true of the syphilitic virus similarly located within the tissues of the central nervous system. Physiologic evidence is, therefore, wholly adverse to the claims of those who favor intraspinal injections of salvarsan for the cure of syphilis of the nervous system. But there are other reasons why the method is not satisfactory, and chief among these is the greater danger attendant on intraspinal therapy. Furthermore, the successful treatment of many of the cases of syphilis of the nervous system calls for intensive salvarsan treatment, by which I mean intravenous injections of 0.3 or 0.4 gm. of salvarsan repeated every three or four days until the patient has had from fifteen, twenty or even fifty injections. A similar number of lumbar punctures for the purposes of intensive treatment would necessarily prove most disagreeable, if not harmful, to the patient; but beyond all these facts it has been definitely ascertained that the serious forms of general paresis or of tabes dorsalis have not been favorably affected by intraspinal injections, and nothing has been accomplished by them that could not have been achieved by the intravenous method.

I am in entire sympathy with Halliburton's view that "particularly regrettable is the divorce between those who pursue their investigations by the bedside and those who work in the laboratory." It is especially regrettable, I would add, that changes in biologic findings should be made the criterion of the efficiency of any therapeutic method. Claims were made for the intraspinal method chiefly by men whose interest was centered on a change in the Wassermann reaction, in the reduction of the cell count of the cerebrospinal fluid, and in a change in the globulin reaction, rather than on improvement in the clinical condition of the patient. After all, the patient remains the chief consideration. One may speak glibly of remissions in general paresis and of improvement in tabes dorsalis, but it takes the experience of a trained neurologist and psychiatrist to estimate at their true value changes in clinical symptoms.

In many particulars the advantages of the intraspinal method have been grossly exaggerated. The opinion has reached the laity, as promulgated by advocates of the intraspinal method, that now general paresis can be cured and by the intraspinal method alone. I have personal knowledge of patients suffering from general paresis who have been treated persistently and on innumerable occasions by intraspinal injections administered by the chief apostles of this method. Some of these patients have had remissions, but I doubt whether a single one has been definitely cured, while all the others have taken the natural but gradual course toward a fatal termination. As for the remarkable reduction in the number of the lymphocytes and the change in Wassermann reaction claimed as a result of the intraspinal method, I can assert definitely, and the truth is already known to many, that the same changes have followed on intravenous injections, pure and simple, on repeated lumbar punctures, and on the introduction of the patient's nonsalvarsanized serum. Evidently the changes in the cerebrospinal content may be brought about in a number of different ways. I do not for a moment question the accuracy of the attractive tables published by the advocates of the intraspinal method, but of one thing I am very certain, that there is absolutely no correspondence between a change in the cerebrospinal content and the condition of the patient. I could instance patient after patient, and some of them I have been able to demonstrate to a number of the members of the section, in whom after both intraspinal and intravenous treatment, for general paresis or for tabes dorsalis, there has been no change in the Wassermann reaction or in the number of cells in the cerebrospinal fluid, and yet the patient has shown most satisfactory improvement in his general condition. To speak of only one patient, who had been given in ten months seventy-seven intravenous injections, the Wassermann reaction was ++++ before the treatment and ++++ after the treatment. The same is true of the cerebrospinal fluid. There were twelve cells before and twelve cells after treatment. The man had a typical paretic speech and severe headaches, but he has, in spite of the lack of change in biologic reactions, shown a most complete remission and has for at least a period of a year and a half returned to his former work and is doing his work satisfactorily. In a large number of cases of tabes in which the patients had received numerous intraspinal injections without distinct improvement, a satisfactory result was obtained when intravenous treatment had been given in our intensive way. I do not wish to

make extravagant claims for the intravenous method, but I do claim that there is nothing which the intraspinal method achieves that cannot be accomplished by the intravenous.

When it is remembered also that in more than a thousand intravenous injections given to patients under my care at the hospital, we have had but two or three untoward results and not a single fatal termination that could in any way be attributed to the salvarsan injections, there seems to be no reason to resort to the more dangerous and to the patient more costly intraspinal method.

My impressions, based on experience of the actual achievements by the intravenous injection of salvarsan are as follows:

The best results are obtained in the cases of cerebrospinal syphilis that are either distinctly vascular in origin or are of the meningo-encephalitic and meningomyelitic type. The meningosyphilitic cases that so often suggest the possibility of latent paresis have been cleared up by a few salvarsan injections. The immediate effect has often been most striking; but however great the immediate effect may have been, I have always made it a practice, even in such cases, to push the intravenous treatment until I was reasonably certain that the morbid process had either been checked or at least made less active. There is often difficulty in establishing the differential diagnosis between these meningo-encephalitic cases and those of true general paresis, so that the doubt may arise whether or not some of the cases of general paresis claimed as cures may not have been cases of this type. Meningomyelitis of the syphilitic type also yields to intensive treatment in the most satisfactory way. The spastic forms of spinal paralysis, the Erb type in particular, which is in all probability a form of a true degenerative disorder, gives unsatisfactory results. In a number of these patients I have been able to bring about all degrees of reductions in the Wassermann reaction and in the cell count, but have never been able to cure, rarely enough ever to improve, a true spastic paraplegia such as Erb described.

As for tabes dorsalis, I cannot claim any actual cure, but in reviewing my cases and seeing the patients months and years after treatment had been instituted, there is no doubt that the patients were satisfied with the results of treatment; that they are better in many ways, and that we cannot afford to disregard this treatment in tabes without, however, claiming more for it than the results justify. There is no doubt that in many instances the vesical symptoms, the sexual impotence, the lightning pains, even the gastric crises, have disappeared under intensive intravenous treatment. On the other hand, I am firmly convinced that in a large number of cases, particularly in private practice, in which the intravenous treatment has been given from the outset, the symptoms have progressed, and full-fledged tabes dorsalis has been developed in much the same way that it would have progressed if no active treatment had been given. The meningomyelitic forms of a tabetic type are the ones that can be benefited most readily.

Finally, in general paresis, salvarsan treatment has not helped me to effect a cure, but it has in some instances retarded the rapid progress of the disease. It has permitted, if not caused, marked remissions to be established for a considerable period of time. Some believe these remissions are the expression of antibody formation. Following the treatment, a number of the patients have been enabled to return to their accustomed work for one, two or even more years, but I do not claim that a single patient suffering from general paresis has been cured of his disease by this or any other method.

The problem for the future is to find some more diffusible remedy, lipoid soluble and less toxic than salvarsan that would be able to pass through the blood stream into the tissues of the brain through the choroid plexus into the spinal canal and attack the foci of spirochetes wherever they may happen to be located. We need not despair of the future, and I believe that if the neurologist and the laboratory worker will cooperate with one another in a rational and impartial manner, an era of satisfactory antisyphilitic therapy may happily dawn on us.

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INTRAVISCERAL AND INTRA-ABDOMINAL PRESSURE *

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The peripheral abdominal wall is a flexible structure, composed chiefly of flexible and elastic muscle enclosed in a flexible but nonelastic aponeurosis. While the wall is flexible to a large degree, it is collapsible only in its front portion. The collapsible portion, or anterior abdominal wall, contrary to the ordinary belief, is but slightly elastic under an ordinary acute strain, owing to the strong layers of aponeurosis surrounding the muscles. Except in chronic processes, such as the development of a tumor by cellular increase, a cyst or ascites, which has behind it the blood pressure or pregnancy, there is but little change in the capacity of the abdomen of an otherwise normal person. Extreme distention of the abdomen may noticeably enlarge the abdominal cavity by pushing up the diaphragm at the expense of chest capacity. By elevation of the ribs, the girth of the upper portion of the abdomen may be increased, but the lower or middle part of the abdomen will be correspondingly diminished. Elevation of the ribs plus extreme distention of the abdomen make tense and collapsible part of the abdominal wall, and increase the girth of the abdomen at all points; but the only actual increase of abdominal capacity is made at the expense of chest capacity by elevation of the diaphragm. The abdominal cavity is air tight, but is by no means a vacuum.

There is always a variable and indefinite amount of pressure in the peritoneal cavity, known as intra-abdominal pressure. This pressure may be greater, but is usually less than the atmospheric pressure.[1]

The degree of intra-abdominal pressure depends on the variable contents of the abdominal cavity. The variable contents are: (*a*) extraperitoneal and mesenteric fat; (*b*) the visceral contents. The visceral con-

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. This paper was presented in New York from hurriedly prepared notes and lantern slides. At that time I made the unwarranted statement that the pressure within the abdomen was greater than atmospheric pressure. Dr. Edward Martin of Philadelphia, who opened the discussion, very properly assailed this statement. I think Dr. Martin was entirely right in his statement that the pressure within the abdomen is ordinarily less than atmospheric pressure, but the question of whether the pressure is more or less than atmospheric pressure need not influence the vital part of this subject, which is "the relative amount of intravisceral and intra-abdominal pressure."

tents are liquids and gases and may be intermittently expelled at any time, thus acting as an immediate safety valve for the establishment of an equilibrium and a normal intra-abdominal pressure. The extra-peritoneal and mesenteric fat is included within the inelastic abdominal wall, and lessens the abdominal cavity in exact proportion to the amount of fat thus included.

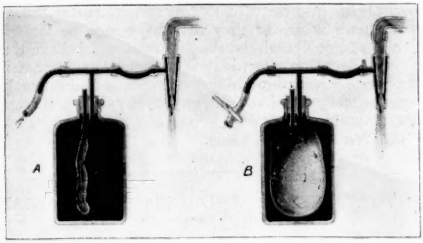

Fig. 1.—Experiment to illustrate the relation of intra-abdominal to intra-visceral pressure: *A*, air in jar and in bag in state of equilibrium; suction not operative on contents of jar; *B*, pressure in jar being reduced by suction apparatus, showing inrush of air and distention of rubber bag in the effort to reestablish equilibrium.

The law of osmosis, by which fluids of different densities pass through an animal membrane and establish an equilibrium, has its counterpart in the relation of intra-abdominal and intravisceral pressure.

I made an interesting experiment, as follows: An ordinary suction apparatus, connected with a water faucet by a rubber tube, which in turn is connected with an aspirating bottle by a T connection, tends to create a vacuum in the bottle, provided the distal end of the horizontal portion of the T is closed. If it is not closed, the air is drawn directly through the tube from the outside, and the air in the bottle remains in a state of equilibrium. If a very thin rubber bag

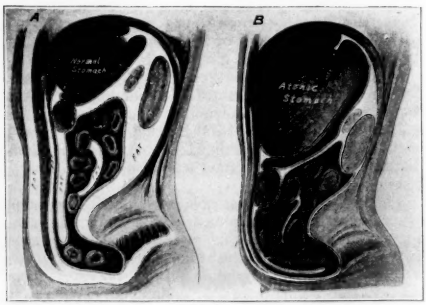

Fig. 2.—Diagram illustrating the rôle of fat in maintaining the tonicity of the hollow viscera: *A*, normal amount of fat in fairly stout person (fat represented by white); stomach and intestine of normal thickness and size; *B*, patient reduced in health, fat having been absorbed; abdominal cavity is enlarged, intra-abdominal pressure is reduced, and hollow viscera are extended and thinned in an effort to establish an equilibrium as shown in Figure 1*B*.

is suspended in the bottle by a hollow tube passing through the cork and connecting the bag with the outside atmosphere, the air within the bag and within the bottle remain in a state of equilibrium so long as the distal end of the T connection remains open (Fig. 1 *A*). If this distal portion of the T connection is closed by forceps (Fig. 1 *B*), suction at once begins to reduce the pressure within the jar and thus tends to make a vacuum. Immediately the atmosphere rushes into the enclosed, suspended rubber bag and distends it in proportion to the degree of vacuum thus produced in the jar.

Thus, a law parallel to the law of osmosis can be formulated: If a thin, elastic container with an outside connection for a source of supply of fluids or gases is enclosed within an inelastic container, there is a constant tendency to establish an equilibrium of pressure. Thus, if a portion of the contents, consisting either of gas or of other substance, is withdrawn from the outside, inelastic container, the pressure on the outer surface of the elastic container is reduced, and a corresponding inflow of contents is brought into the elastic container from the outside, for the purpose of establishing an equilibrium.

In the case of the abdomen, the abdominal wall is the outside, inelastic container, and the hollow viscera represents the inside, elastic container with the outside source of supply through the mouth. Within, and partially filling the abdominal cavity, is a variable

Fig. 3.—Roentgenogram illustrating the influence of fattening on position and tonicity of the hollow viscera: *A*, prolapsed, dilated, atonic stomach of a young woman who was a bed invalid, weighing 62 pounds; B, small, tonic stomach, with normal peristaltic waves, observed in same patient two months later, after forced feeding and increase of weight to 119 pounds; patient restored to perfect health by no other treatment than forced feeding. (Courtesy of Dr. Sears, who directed the treatment.)

quantity of fat. Intra-abdominal fat is apparently deposited under much lower pressure than are the cells of a tumor, pregnant uterus or ascitic fluid. The deposition of fat, therefore, within the abdominal cavity does not materially stretch the abdominal wall in a normal person. However, it is sufficient to increase the size of an already existing umbilical or postoperative ventral hernia. If a large umbilical or postoperative ventral hernia exists for a long time in a fat patient, intra-abdominal fat is deposited in proportion to the contents of the hernial sac, making it difficult, and at times impossible, to replace the hernial contents without removing some of the abdominal contents, such as the great omentum.

A patient who has been moderately fat for some reason loses flesh; the fat in the abdomen is correspondingly absorbed (Fig. 2 *A* and *B*). The intra-abdominal pressure is lowered, and there is a tendency to a gradual, atonic dilatation of the hollow viscera in establishing an equilibrium. Digestion is disturbed, bowel action becomes torpid, and all of the secretions are below par. The patient often develops into that low state of health ordinarily referred to as "asthenic,"

and, in extreme cases, has even been referred to as "neurasthenic." If this poor state of health is permitted to go on for months or years, the abdominal muscles become weak and flabby and give way under the malnutrition and gas distention as well as the weight of the lowered organs, until finally the entire shape of the abdomen is changed.

The late Weir Mitchell evolved a successful empiric way of treating these patients by rest, recumbency, forced feeding and massage. Being a neurologist, he attributed his success to "padding the nerves with fat." To the plan of treatment thus evolved by Mitchell, the orthopedic and postural phases of the subject have been added, and have been notably developed by Goldthwaite of Boston and Franklin H. Martin of Chicago.

Dr. N. W. Jones states that he has frequently been able by these methods to increase the girth of the abdomen at the rib arch 6 inches or more—largely by position and exercises which tend to lift the chest and upper abdomen and strengthen the muscles of the lower abdomen. Thus, we may say that by strengthening and

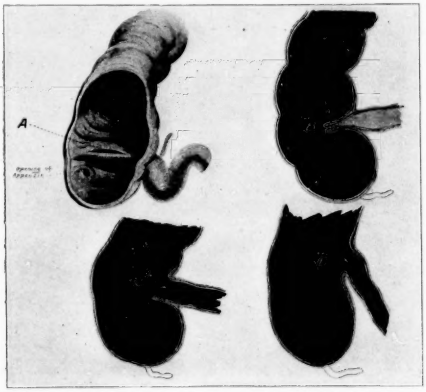

Fig. 4.—Anatomical importance of the ileocecal valve: *A*, ileocecal slit and valve (Gray's Anatomy); *B*, diagram illustrating a competent ileocecal valve (elaborated from Gray's Anatomy); *C*, partial incompetence of ileocecal valve (Kellogg); *D*, complete incompetence of ileocecal valve (Kellogg).

readjusting the abdominal wall, combined with the deposition of fat within the abdomen, the normal intra-abdominal pressure can be restored. Roentgenologic examination of patients relieved by these methods often shows that a stomach which is ptosed and atonic before treatment assumes its normal position, takes on its normal size and normal peristaltic action after treatment. Figure 3 *A* and *B* shows but one of many similar results which I could exhibit. In a certain percentage of these patients the cecum and ascending colon are entirely mobile and have a long mesentery with acquired bands, referred to by Lane, which may attach to the colon in an effort to hold it up, and which may cause great pain on the right side (usually taken for appendicitis), or may come across the duodenum, making a direct drag on the duodenum (producing symptoms similar to duodenal ulcer). These cases are often definitely surgical, but the surgical measures which, in my opinion, should always be limited to replacement and indirect fixation, must be followed by increase of intra-abdominal pressure through deposition of fat combined with athletic development of the abdominal wall.

Having briefly discussed the relation of intravisceral to intra-abdominal pressure, and its bearing on clinical medicine, I shall next consider the relative pressure in the various parts of the intestinal canal, and its clinical importance. The word "jejunum" means empty. Very

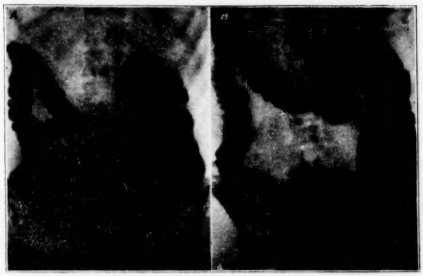

Fig. 5.—Roentgenogram showing case of completely incompetent ileocecal valve, before and after operation: *A*, complete incompetence of the ileocecal valve, showing filling of entire small intestine with barium enema; clinical symptoms very marked; *B*, intestine of same patient two months after operation; roentgenogram taken by same technic as in Figure 5 *A*; clinical symptoms entirely relieved. (Another picture taken one year after operation showed valve still competent. A picture taken two years after operation showed partial incompetence of valve, and partial return of clinical symptoms.)

little gas or fluid is found in it at one time. As the food passes down to the ileum, gas begins to form, and the intravisceral tension is greater. In the large intestine, a portion of the food and waste takes on bacterial digestion, producing a great deal of gas, and as a consequence the pressure within the large intestine is much greater than within the small intestine. So great is this liability to distention that nature has produced a valve, which has been done by a form of intussusception of the small bowel into the large (Fig. 4 *A* and *B*). This valve in a normal person is usually

Fig. 6.—Roentgenogram showing distended ileum which commonly follows ileocolostomy: *A*, ileum distended with gas and barium, immediately after one meal and twelve hours after another; *B*, barium and gas in widely distended ileum twenty-four hours after meal.

competent, so it is often found that the large intestine is intensely distended while the small intestine is relatively collapsed. A peristaltic wave traveling from the cecum toward the hepatic flexure creates diminished intravisceral pressure behind it. This diminished intravisceral pressure, following in the wake of the peristaltic wave, permits the ileum to empty a portion

of its contents into the distended large intestine. When the wave has exhausted itself, the normal intra-intestinal pressure is again resumed and the valve again closed. The gradual obstruction of the large intestine in its lower portion, by a growth of any kind, often produces such extreme intra-intestinal pressure as to reduce the normal intussusception of the small intestine into the large and thus destroy the competence of the ileocecal valve. This I have demonstrated in doing Brown's ileostomy for obstruction in the sigmoid, for in those cases fluid passed through the distal segment of the ileum into the large intestine usually runs back, even though the obstruction has been removed below, while in ileostomy performed for ulcerative colitis, the colon may usually be flushed out through the distal segment of the ileum without a return from the colon through the ileocecal valve. Long-continued constipation, with large accumulations of gas in the cecum, is frequently followed by incompetence of the ileocecal valve, as pointed out by Kellogg and Case. If this incompetence is complete and the regurgitation is extensive, it often has important clinical significance. Kellogg has devised an ingenious operation for reproducing the normal intussusception. I have seen a few cases in which the incompetence of the ileocecal valve produced such serious symptoms that I performed a modified Kellogg operation for its relief, with functional satisfaction and complete mechanical cure, as shown by the pictures before and after operation. Figure 5 *A* and *B* shows one of six similar cases. While I do not do the operation exactly as Kellogg recommended, I used his idea, and was surprised at the results, for I did not expect much of it. As yet, however, I am not prepared to say how valuable the procedure is.

Fig. 7.—The result of the direct implantation of the bile duct into the intestine: *A*, direct implantation of the bile duct, without valve protection; *B*, bile duct a month later, showing distention from intra-intestinal pressure.

I have had occasion to operate on a considerable number of patients who had had short-circuiting operations performed by other surgeons who used Lane's method. In some cases, performed by amateurs afraid to do the complete operation, a simple ileosigmoidostomy without severing the distal portion of the ileum had been performed. In all cases, whether or not the ileum was severed, it was very much dilated, showing that when the ileum is subjected to the greater pressure, of the large intestine by an absence of an ileocecal valve it becomes permanently dilated, no matter whether there are clinical symptoms or not. Figure 6 *A* and *B* shows this point in one of my own cases following ileosigmoidostomy. The colon in this case was later removed, at which time the ileum was found to be much distended and thick and contained semi-solid fecal matter for 3 or 4 feet above the point of anastomosis.

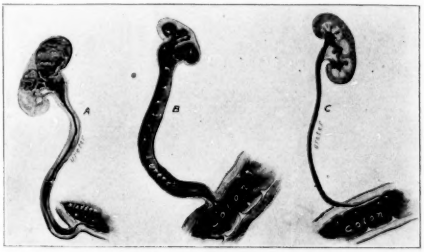

Fig. 9.—*A*, thickened ureter and pus kidney, which may be produced experimentally by infecting the tissues around the lower end of the ureter (true ascending infection); *B*, "dead kidney" and dilated ureter, following direct implantation of the ureter into the colon; this result has been questionably referred to as "ascending infection;" it is more probable that the kidney has been destroyed and the ureter dilated by intra-intestinal pressure applied to the inside of the ureter; *C*, normal kidney and undilated ureter which follows the submucous, or indirect, implantation of the ureter into the colon.

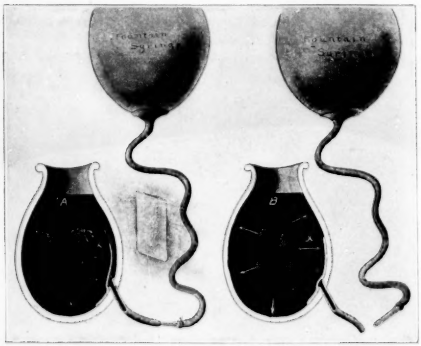

Fig. 8.—Artificial valve in a rubber bag, to illustrate the principle of intravisceral pressure: *A*, fluid flowing into a rubber bag under pressure; *B*, closure of valve as soon as extra outside pressure is removed.

Next we may consider the relative degree of pressure in the hollow viscera themselves, and in the glands and ducts emptying into the viscera. In 1908-1909, while I was experimenting with methods for removal of the head of the pancreas in two stages, the first of which included the transplantation of the common bile duct to another portion of the duodenum, it was discovered that the duct which had been directly planted into the duodenum at the first operation was invariably found dilated at the time of the second operation (Fig. 7 *A* and *B*). In one instance the duct was as large as the duodenum itself. The opening of the duct into the intestine was large, and all of the ducts well up into the liver were much dilated. This phenomenon, being observed universally, left but one rational conclusion to be drawn, namely, the greater pressure within the intestine was too much when applied to the inside of the thin bile ducts. Investigation of the duodenum and bile ducts of dogs showed that the normal duct, after passing through the muscular wall of the intestine, passed along immediately under the loose,

movable mucous membrane for a distance of approximately half an inch before it entered the intestinal lumen. This was sufficient explanation of how the normal entrance of the bile duct prevented its dilatation by intra-intestinal pressure. To prove this abstract principle further, a catheter was cemented into a hole in the wall of a fountain syringe. On the inside of the fountain syringe a thin flap, or pocket, was cemented. Another fountain syringe, hung some distance higher, was attached to the catheter through which the fluid was permitted to run from the higher bag into the lower one. When the nozzle was withdrawn from the end of the catheter, the weight of the fluid from within forced the valve closed and no fluid escaped (Fig. 8 *A* and *B*). This problem, then, was clear — the duct must be placed immediately under the loose, movable mucous membrane for some distance before it is permitted to emerge into the lumen of the intestine, if the intra-intestinal pressure is to

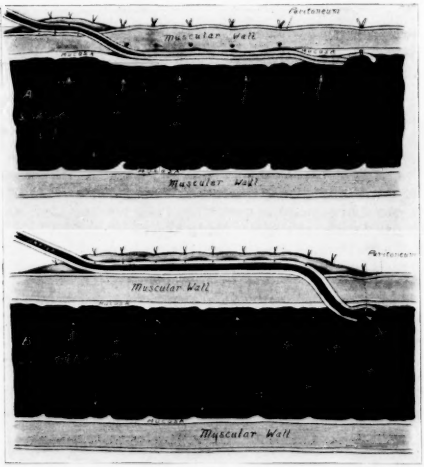

Fig. 10.—Scheme of two methods of ureteral implantation into the colon: *A*, diagram illustrating technic of submucous implantation into the intestine; showing how the intra-intestinal pressure, acting on the movable mucous membrane, collapses the ureter and makes a valve; *B*, diagram illustrating the scheme of Stiles' operation, which is a direct implantation, supplemented by the application of the Witzel principle as applied to gastrostomy; in this instance the ureter runs along on the outside of the intestine, and is covered by folding over it the wall of the intestine; valve action is not probable in this operation, owing to the thickness of the intestinal wall.

be brought to bear in closing the duct. The technic of implanting the duct in this manner was quickly devised and tried on the living dog. Six ducts were implanted by this method, and not a single one of the ducts thus implanted showed material dilatation, in contrast with six implanted by the direct method, all of which were enormously dilated, as stated before.[2]

While this experiment with submucous implantation of the bile duct had been a complete success, so far as creating a perfect valve was concerned, there seemed to be some doubt as to whether the ureter, which entered the bladder in much the same way, could be implanted into the intestine with the same degree of success. A complete search of the literature of the Surgeon General's Library, consisting of a review of some 254 articles on the subject, found the admission of practically every experimenter that up to that time a successful method of implanting the ureter into the bladder had not been devised. In the beginning of my experiments with the ureter I found that it also emptied into the bladder in a submucous position. My first set of experiments included six ureters implanted

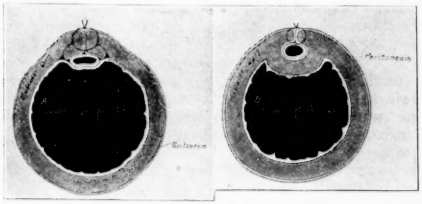

Fig. 11.—Cross section scheme of submucous implantation and of Stiles' operation, for comparison. (See Surgery, Gynecology and Obstetrics for technic of Stiles' operation, 1911, **13**, 127.)

into dogs' intestines by the direct method. When the dogs died or were killed some months later, the ureters were in every instance found to be enormously dilated for the entire distance between the intestine and the kidney. In one instance the ureter was an inch in diameter. In those dogs living for several months, the kidney tissue had all been absorbed, leaving a hull. Whether these kidneys had been destroyed by an infection, ascending the widely dilated ureteral opening and ureter, or by excessive intra-intestinal pressure brought to bear within the ureter and along the ureter to the kidney, could not be definitely determined, but one thing was apparent: A ureter implanted directly into the intestine, without a protecting valve, invariably becomes an elongated and distended diverticulum of

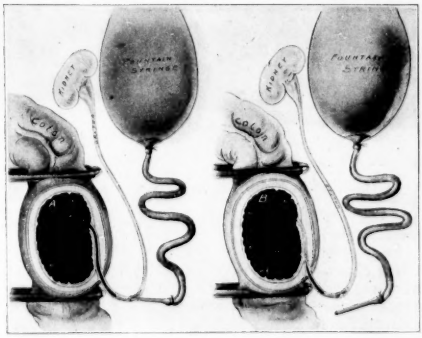

Fig. 12.—Testing competence of the valve in a removed specimen following submucous implantation in a dog: *A*, fluid run into the segment of intestine including the implantation area under pressure; *B*, outside pressure has been removed; intra-intestinal pressure closes valve completely.

the large intestine and is accompanied by destruction of the kidney (Fig. 9 *B*).

Six kidneys in which the ureter was implanted into the large intestines of dogs by the submucous method (Figs. 10 *A* and 11 *A*) showed that in not a single instance had the kidneys become infected or diseased

2. The technic of this operation and the details of the experiments were published in the Annals of Surgery, December, 1909.

in any manner.[3] The dogs in these cases were killed from four to six months after the implantation. The intestine, ureter and kidney were all removed for tests. The intestine in each case was clamped above and below the implantation, thus isolating and making a closed sac of this segment. The ureter was split, the nozzle of a fountain syringe was inserted into the opening, and the water run into this clamped segment of the intestine under pressure. When the nozzle was withdrawn, not a drop of water flowed back through the ureter, even though the intestine was squeezed with a good deal of pressure (Figs. 12 and 13, *A* and *B*). In one instance the intestine was actually squeezed to the point of rupture elsewhere before a single drop of water would flow back through the ureter.[4] I feel that I have proved my principle mechanically and experimentally, but one may ask,

Fig. 13.—Comparison of normal valve in dog's bladder (*A*) with postoperative valve, following submucous implantation of ureter in a dog's large intestine (*B*). This represents the same specimen shown in Figure 12 *A* and *B*, in which the valve acted perfectly, without leakage.

"How about clinical results?" Dr. Charles H. Mayo, who was chairman of the section when these experiments were presented, immediately applied the principle clinically, and in an interview (December, 1916) he told me that he had implanted both ureters (doing the operations one ureter at a time) in something like fourteen cases, making twenty-eight ureteral implantations in all. Some of these were done for cancer and some for exstrophy of the bladder. In only one case has there been a bad result, or evidence of destruction of the kidney. In this case (which was for cancer of the bladder) the ureter was much thickened and dilated at the time of the operation so that it was not collapsible. This patient died. Dr. Mayo says that he has realized that this was not a proper case for the operation and recommends that in cancer cases in which the ureter is much dilated and not easily collapsible, the ureter should be drawn out through the lo[illegible]. One of Dr. Mayo's patients lives in Rochester, and, therefore, has been under close observation

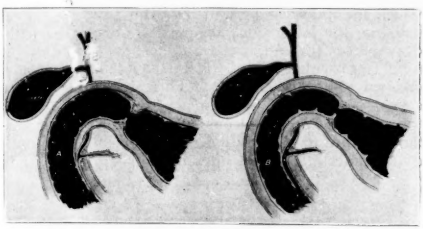

Fig. 14.—Scheme showing theory as to the probable function of the gallbladder: *A*, intra-intestinal pressure, being normally greater than pressure in the liver ducts, closes the valve during intervals of digestion when bile flows into gallbladder; *B*, intra-intestinal pressure is diminished or released in the wake of a peristaltic wave; this permits the opening of the valve, and a consequent outpouring of bile.

for more than five years. This series of cases, when Dr. Mayo reports them, will, I believe, mark a new era in urologic surgery, for no such successful report of cases in which the ureter has been transplanted into the intestine has been made up to date. While I myself have had the opportunity to implant only four ureters in three patients, these cases have been equally successful.

In connection with this subject, I wish to call attention to two other points: 1, Every surgeon has noticed that the common bile duct becomes dilated sometimes to a large size after the gallbladder has been removed or has been functionally destroyed by contraction down on gallstones. In one instance of contracted gallbladder I found the common duct dilated

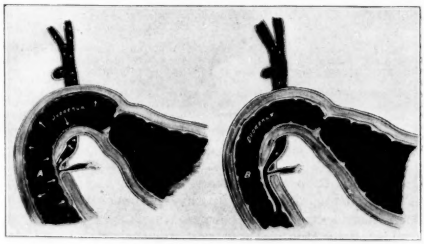

Fig. 15.—Diagram illustrating a theory as to the probable cause of dilatation of the common duct following removal or destruction of the gallbladder: *A*, during intervals of digestion (as at night) the valve is closed by intra-intestinal pressure, thereby producing an equal pressure in the ducts, causing them to dilate; *B*, during digestion, local intra-intestinal pressure is intermittently released in the wake of peristaltic waves, permitting the emptying of the dilated bile ducts, just as the normal duct and gallbladder is emptied.

to fully three-fourths inch in diameter, which caused me to open the bile duct looking for a duct stone, notwithstanding the fact that the patient had shown no jaundice or other evidence of common duct obstruction. Nothing was found in the duct, and the mouth was

2. The details of these experiments were printed in THE JOURNAL A. M. A., Feb. 11, 1911, p. 397.

4. The specimens resulting from these experiments were exhibited to the Section on Surgery at the St. Louis Session of the American Medical Association, 1910.

well open into the duodenum. 2. When a gallbladder fistula is established with the surface, all observers have noticed that the bile flows more freely during the night or during intervals of digestion than during digestion. In other words, the bile flows into the gallbladder during the intervals of digestion. The gallbladder seems to serve as an elastic safety reservoir which takes off the pressure from the bile during certain times of the day. It seems likely that this may be explained on the basis that during active digestion peristaltic waves are intermittently passing down the intestine. In the wake of these waves there follows a diminution of the intra-intestinal pressure, which permits the temporary flow of bile from the duct. As soon as the wave has ceased, the normal intra-intestinal pressure is resumed and the valve is closed. During long intervals of digestion, and particularly during the night, the peristaltic waves are few. The intra-intestinal pressure is more nearly constant, and the bile is forced out into the gallbladder, or out through a gallbladder fistula as the case may be (Fig. 14 *A* and *B*). If the gallbladder has been removed or destroyed, an equilibrium of pressure in the gall ducts and intestines is established in the long intervals between peristaltic contractions, with the result that the full degree of intra-intestinal pressure in the bile ducts during the intervals of digestion produces permanent dilatation of the duct (Fig. 15 *A* and *B*).

In connection with this problem, it is well to mention the fact that the urine coming into the bladder through the normal valve is seen to come in jets of several drops at a time, while it passes through a ureteral catheter with a steady drip. Is it, therefore, not probable that the jets seen in the first case are due, partially at least, to the rhythmic contraction of the bladder which at certain intervals increases the intravesical pressure and temporarily closes the valves, while, when the catheter is passed up into the ureter, the bladder contraction is not operative on the flow?

ABSTRACT OF DISCUSSION

DR. EDWARD MARTIN, Philadelphia: As to the statement in regard to inelasticity of the belly wall, it is one of the most elastic of all structures, to wit: the circumference changes before and after dinner, as shown by the relative bigness of your garments. As to intra-abdominal pressure, on operation, with the first admission of air there is a cavity, hence a negative pressure. The pressure is constantly varying; at times it is life-threatening from its effect on the circulation and the respiration. Every vital process and every reparative process depends on the freedom and rapidity of the blood supply, and probably the underlying reason for abnormal abdominal conditions associated with ptosis is a circulatory interference and not a mechanical interference with the progression of the intestinal contents. Of all deceiving factors, the roentgenogram ranks among the first. Ochsner has shown that any viscus may be in any position and function normally if the blood supply is not interfered with.

Concerning the mechanism of the valves, going back to fundamental principles, the law of sphincters is that when irritated they contract. Flaccidity is almost unknown; the anal, the pyloric, the cardiac, urethral sphincters give us trouble only by contracting. In the first few months of life the cardiac valve is normally incompetent, a period for quantitative errors of judgment. Later, if abnormal, it becomes permanently tight. Any neighboring pathologic condition may cause it to grip tight, the sphincter having its own centers which respond in only one way. An incontinent ileosphincter is extremely rare. They all yield to continued abnormal back pressure. The cecum is usually empty and the stimulus to the cecum to contract is a sudden, violent gush from the ileum. A slow ooze, as through a spasmodically contracted sphincter, will not give this stimulus. I cannot see the mechanism of a vacuum formed in an absolutely soft gut. It is probable that the beneficial effects of operation are not from tightening a loose sphincter, but from loosening a spasmodically tight sphincter. We are cursed by pylorospasm. How do we cure pylorospasm? Usually by curing the lesion reflexly responsible for it, and sometimes by paralyzing and putting out of service the muscle. The rule of the sphincters is that they are always tight. Why is a patient with chronic appendicitis constipated and toxic? Because he has a loose sphincter? No; because he has a tight sphincter. The lower ileum is the portion where the intestinal contents remain longer than in any other part of the intestinal canal. With a teasing chronic appendix the reflex spasm prevents that rapid distention of the cecum which excites cecal contraction. Why do these patients get well of their constipation by the taking out of a fibrosed appendix? And why do so many of them suffer from pylorospasm? Because the sphincters work together; that is, the ileocolic and the pyloric. We have had no success in implanting the ureters, and we have done it very carefully; no success because there always occurs a narrowing at the point of implantation and an ascending infection. Sweet has attempted it many times. In only two reputed cases has it been done successfully without a segment of the bladder wall. I agree that the mechanism of the vesical sphincter of the ureter is, in part, a mechanical one.

ORGANIC CHANGES IN THE CENTRAL NERVOUS SYSTEM PROBABLY DUE TO FOCAL INFECTIONS *

GEORGE W. HALL, M.D.
CHICAGO

It is with a full knowledge of the vulnerable points which may be cited in reasoning from cause to effect that I present the history of these cases which compose the nucleus on which this paper is based. However, clinical evidence and resulting treatment in other cases not here reported encourage me to present this article, for I realize the fact that the chain of infection leading from the tonsils and teeth to the central nervous system in these cases is not complete, since two of the patients are still living.

Orr and Rows[1] state that infections may ascend from deep foci of infection through the lymph channels which surround the spinal nerves and roots, and extend to the pia and there set up inflammatory reaction. They have observed such conditions in staphylococcus infection. They state that toxins can spread along the roots of these nerves without injuring the individual nerves. They have shown that bedsores may produce degeneration in the lumbar enlargement, and sores on the arms have produced degeneration in the posterior columns of the cord on the same side as the focal infection. They have demonstrated similar changes in the lower portion of the cord arising from a pelvic cellulitis and renal abscess. While in their experience the dorsal columns of the cord have more often become involved than other regions, yet they have explained that these toxins may so spread as to produce changes in the anterior radicular fibers, and also in the lateral columns of the cord. Such changes, according to their statement, are the direct result of absorption from some peripheral septic focus.

* Read before the Section on Nervous and Mental Diseases at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Orr and Rows: Brain, **4**, 1906.

Walker[2] described three cases in which an acute ascending paralysis occurred in the course of a chronic cystitis, and suggested that the cord lesion was due to an extension of inflammation along the nerves from the bladder. That such conditions may exist is verified in tetanus and rabies, which no doubt spread to the cord by way of the nerves.

Marie and Morax cut the nerve of the limb of an animal and injected a lethal dose of tetanus organism into the animal's paw, and no convulsions followed.

Homen and Laitinen, after injecting streptococci into the sciatic nerve, traced the organisms to the meninges of the cord.

Pirrone experimented in like manner with the pneumococcus, and found changes in the cord. In the peripheral nerves, spinal roots and cranial nerves, there is a constant stream of lymph ascending toward the central nervous system, the main current of which lies in the inner meshes of lymph spaces of the perineural sheath. Through these passages, according to this author, the toxins no doubt reach the central nervous system and may spread in the lymph spaces of the pia and arachnoid to distant points. Changes in the central nervous system, as we all know, frequently accompany primary anemia, less often secondary anemia, occasional chronic uremia, diabetes, etc. It is generally accepted that these changes are due to toxins rather than actual organisms. The source of these toxins, especially in pernicious anemia, may be found in the gallbladder, appendix and other foci, so that it is just as reasonable to believe that focal processes in the teeth and tonsils may produce similar changes.

It has been definitely determined that a primary lesion of specific origin on the skin may produce toxic conditions in the spinal fluid, even before the Wassermann test shows a positive reaction. Such conditions can arise by direct transmission through the peripheral nerves from the focus of infection to the meninges of the cord.

Lugaro states that the stronger and more local the action of the toxins, the more often does secondary change take place, while a diffuse and weaker toxin produces a purely primary degeneration.

In a series of eight cases, comprising lesions of varying nature and situated in different parts of the body, Orr and Rows found in each case a cord lesion much more intense in the segment of the cord corresponding to the nerve supply of that area.

REPORT OF CASES

I report three cases which I believe demonstrate the work of these investigators:

CASE 1.—R. M., aged 55, was referred to me by Dr. J. L. Miller in the latter part of September, 1916. His present trouble commenced about eighteen months previous, when he complained of pain in the left shoulder and cervical portion of the spine. This pain continued with exacerbations at times for a period of one year, and then disappeared. About six months after the onset of his first symptoms he noticed that his right hand was becoming shaky when he tried to sign his name. In the spring of 1916, he noticed a weakness in the right leg and small blisters on the sole of the right foot; at times he experienced cramps in the muscles of the right calf.

Examination by Dr. Campbell in 1915 revealed large tonsils, and pyorrhea of the two lower incisors; the sinuses were normal.

My examination revealed an atrophy of the shoulder group muscles on both sides, more on the right, with an atrophy of the muscles of the arms and forearms, and also of the thenar and hypothenar muscles of the hands, these atrophic changes being more pronounced on the right side. Marked fibrillary twitchings were present in these different regions. The left lower extremity was practically normal; the right lower extremity was spastic, with increased reflexes and a positive Babinski reflex; there was no atrophy of muscle in the lower extremities, and no sensory disturbances over any part of the body. The optic nerve was normal. There were no bladder disturbances. The abdominal reflexes were present.

We deemed it advisable to exclude syphilis; therefore the patient was sent to St. Luke's Hospital and spinal puncture made. The spinal fluid was normal in every particular and the blood Wassermann test negative. We made a diagnosis of degenerative changes in the spinal cord, involving the anterior and lateral portions in the cervical region of the spinal cord. We recommended that a Roentgen-ray examination be made of the spinal vertebrae. Changes of an ostearthritic nature were found, especially in the cervical portion, and to a less extent in the lumbar portion of the cord.

CASE 2.—Mrs. S., aged 58, was referred to me by Dr. John L. Porter in January, 1917. She stated that her present trouble began about September, 1915, when she experienced some pain in the lumbosacral region, and some stiffness in the calf muscles of the left leg. About one year ago the calf of the right leg became stiff and she still has that feeling of stiffness in both lower extremities. A few weeks after the onset of this trouble she noticed a weakness in the extensor muscles of both feet, stating that she could not raise the toes from the floor normally. She has never suffered any pain in the lower extremities. The weakness in the lower extremities gradually increased until, at the time of examination, she was compelled to support herself with crutches in order to walk around the house.

Examination showed some atrophy of both lower extremities below the knees, more marked on the right than on the left, a partial foot drop on both sides, with a possible Babinski reflex on the right. There were no fibrillary twitchings, the knee-jerks were present and the Achilles reflex absent; there were no sensory disturbances.

We made a diagnosis of organic change in the anterior portion of the spinal cord in the lumbar region, and suggested spinal puncture and blood tests. Both fluids proved to be normal. We further suggested that roentgenograms be made of the spinal vertebrae, which revealed positive arthritic changes. A history of pyorrhea was obtained, on account of which six teeth had been extracted in August, 1916. A pelvic examination was made by Dr. T. J. Watkins at my request, and the report was negative. A laparotomy had been performed fifteen years previous for the removal of a benign tumor of the right ovary. The only apparent cause for the changes in the central nervous system of this case originated in the teeth.

CASE 3.—Through the courtesy of Dr. Peter Bassoe, I wish to report a third case which came under his observation for the first time, June 8, 1912. Single man, aged 25, of excellent habits and with a negative venereal history, a history of nephritis following influenza when 11 years old, in April, 1911, had a slight swelling of the knees and ankles for about two weeks. The patient was apparently well after this attack until March, 1912, when nodules developed in the skin of the legs and swelling about the ankles (erythema nodosum?). In April, he had occasional chills, followed by a temperature rising to 102 F. These chills occurred at first once a week, then twice a week. Late in May, he began to have attacks every few days, consisting of vomiting followed by diplopia. These symptoms were followed by numbness in the left leg and slight difficulty in swallowing. For some time previous, the gums had been swollen and the teeth sore.

Examination revealed right external rectus paresis; slight right facial paresis of the right side; loss of pain and temperature sense over the right trigeminal area; absence of right corneal reflex; analgesic areas on the left side of the chest and abdomen, and in places on the left arm; tactile sensation normal; tendon reflexes normal. June 9, he was admitted to the hospital with a temperature as high as 102 F., which continued for five days, when it returned to normal. He had

2. Walker: Lancet, London, March 11, 1905.

almost a continuous hiccup, and repeated vomiting attacks during the first four days in the hospital. He received treatment for pyorrhea by Dr. Frederick B. Moorehead. The Wassermann test was negative. The patient gradually improved, could again walk, although he staggered somewhat, and a slight diplopia persisted. In August, 1912, he had a relapse for a time, and when examined again, presented analgesia of the right side of the face and the entire left side of the trunk and extremities. The right arm and leg were slightly weaker than the left. He had a bilateral ankle clonus, more marked on the right side; other tendon reflexes stronger on the right side. He again improved after his mouth had been treated. In December, 1912, left hemiplegia quite suddenly developed, and it was definitely stated that this attack was preceded by an aggravation of the pyorrhea. In June, 1913, he returned to the hospital for a week, when examination showed a right trigeminal anesthesia, left spastic hemiplegia, right hemianalgesia, and thermanesthesia.

Nov. 4, 1913, he became stuporous, and had dysphagia, bilateral Babinski reflex and ankle clonus; no voluntary movement of either extremity; abdominal reflexes absent, right corneal reflex absent, and left present. He developed a rise of temperature, and signs of pneumonia appeared. He died Nov. 6, 1913.

A necropsy was held, November 7, by Drs. F. R. Nuzum and Peter Bassoe. The only finding outside of the brain was a bronchopneumonia. The brain revealed moderate edema of the pia; the right half of the upper portion of the pons was distinctly softened. A pipet was introduced to secure material for culture. No pus was present. Subsequent examination of the brain after hardening with liquor formaldehydi revealed a distinct, nonsuppurative inflammation in the softened part of the pons, chiefly characterized by large accumulations of mononuclear cells about the vessels.

COMMENT

The history of these cases shows not only a history of focal infection, but also in two of the patients slight arthritic changes in the vertebrae, most pronounced at those points which correspond to the most definite changes in the central nervous system.

104 South Michigan Avenue.

ABSTRACT OF DISCUSSION

DR. H. T. PATRICK, Chicago: I am far from wishing to deny involvement of the central nervous system from focal infection, but I think Dr. Hall has hardly proved his case. In all his cases he found evidence of arthritis, and I do not see the necessity for assuming infectious involvement of the central nervous system to account for the symptoms. These could all be accounted for by secondary involvement of the nerve structure by way of the arthritides. In the last case we are in doubt whether or not there was softening due to vascular occlusion. If these cases were due to teeth and tonsils, they were hemogenic, which had nothing to do with direct invasion of the nerve trunks and thence by way of nerve roots to the spinal cord. This route is as yet hypothetic, but this does not prevent it from being an attractive field for investigation, and I am glad that Dr. Hall has called attention to it. My own experience has been that in the vast majority of these cases what seem to be neuritides are really arthritides.

DR. J. P. MUNROE, Charlotte, N. C.: I am inclined to agree with the last speaker. Most of these cases can be explained otherwise than by an involvement of the central nervous system.

DR. A. L. SKOOG, Kansas City, Mo.: It is interesting to note that we find infections of the central nervous system secondary to other foci in the body. In these cases I am inclined to think they are not conclusively proved. I believe the fault rests on the bacteriologic examinations, which have not been completely conducted.

DR. G. W. HALL, Chicago: I am entirely satisfied in my own mind as to the relation between cause and effect in these cases. I think in the course of two or three years these same gentlemen will have changed their minds as expressed today. In the first case the patient was taken to a hospital where they found, according to the roentgenograms, changes in the cervical vertebrae, as I have reported. The same patient was taken to a different hospital, and Dr. Billings was called in and gave an independent opinion. He declared that there were no arthritic changes in the spine, and felt that the changes were of a multiple sclerotic nature and that the primary infection came from the teeth. This opinion was independent of mine.

A REPORT OF A GROUP OF ONE HUNDRED AND TEN CASES OF POLIOMYELITIS

FROM THE ACUTE ONSET TO THE PRESENT TIME *

CHARLES OGILVY, M.D.
NEW YORK

The group of 110 cases of poliomyelitis on which this report is based, with fifteen additional cases, represents the result of the study of an epidemic in a suburb of 35,000 inhabitants of New York City during the summer of 1916. These 110 cases were all isolated in hospital accommodations where each patient could be continuously observed.

The origin of the disease in this community was definitely traced through a carrier coming from an infected household in Brooklyn. The district first infected was an Italian community, in which particular section forty-two cases developed. This community was somewhat crowded, although in a comparatively clean neighborhood.

The first case developed on July 13 and the last one on Oct. 25, 1916. No other cases have developed from that time up to the present date.

Early Diagnosis.—The majority of the cases were somewhat similar and developed as follows: The child was said to have been sick from one to four days with fever, usually vomited and frequently gave a history of pain in the head, neck, back or extremity. On examination, the child was found to be lying on its side, with the head thrown back, quiet or asleep. When aroused it was usually irritable. In 81 per cent. of the cases there was stiffness of the neck.

Other evidences of the disease were found to be an abnormal condition of the knee jerk, and disturbances of reflexes throughout. In addition to these clinical findings, the diagnosis was corroborated by a spinal fluid examination. These specimens were all examined at the von Wedel Laboratory of the New Rochelle Hospital, and the diagnosis was confirmed in many doubtful cases by this examination. A lumbar puncture was made in eighty-two cases.

One course of the disease frequently seen was that in which the child was sick for a day or two and then apparently better, being allowed to get out of bed, after which the fever returned and the typical symptoms developed. It may be here remarked that there was but one case resembling the classical picture so often described in textbooks, of the child going to bed perfectly well, taken ill during the night and found to be paralyzed in the morning.

There were twenty-five cases of suspected poliomyelitis in which the spinal fluid gave negative findings. In each instance, the cell count was under 20.

* Read before the Section on Orthopedic Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

The fluid was normal, Fehling's always unreduced. The fluid was always clear, and there was no increase in albumin or globulin. In none of these twenty-five suspected cases of poliomyelitis giving negative spinal fluid findings did poliomyelitis subsequently develop. On the other hand, in none of the cases in which the spinal fluid gave positive findings was a mistaken diagnosis made — all developed poliomyelitis. From these data, it is fair to assume that a definite early diagnosis can be made by carefully studying the clinical symptoms in conjunction with the laboratory findings of the spinal fluid.

During the first week nineteen patients were admitted to the hospital. In one month there had been eighty-one patients admitted. By October 25, 110 patients had been admitted, the time of detention in each case being not less than six weeks. There were fifty-six male patients, or 50.9 per cent., and fifty-four female patients, or 49.1 per cent. There were only three colored children, or 2.7 per cent. This is undoubtedly due to the fact that a small proportion of the population are colored people.

The ages varied from 2½ months to 45 years. Those patients under 5 years numbered eighty-five, or 77.3 per cent.; from 5 to 10 years of age, fourteen, or 12.7 per cent.; from 10 to 15 years, eight, or 7.3 per cent.; over 15 years, three, or 2.7 per cent.

It is interesting to note that in eight famiiles there was more than one case. Also, that the houses having more than one case, not in the same family, were six in number, so that no fewer than seventeen cases of the disease might be assumed to have been contracted from other members in the same house, a percentage of 14.5.

On further study of this subject, however, we learn that in but six of these seventeen cases did a sufficiently long period elapse to justify the conclusion that the disease was contracted from other members of the same household, as explained in the accompanying table.

CASES OCCURRING IN SAME HOUSEHOLD

Name	Date of Onset	Name	Date of Onset
J. C.	July 24	B. T.	September 4
T. C.	July 26	S. G.	July 18
J. H.	July 27	M. M.	July 18
P. H.	September 8	J. P.	July 19
P. F.	August 9	A. P.	August 1
T. F.	August 10	M. D.	August 3
J. P.	August 9	D. C.	July 21
I. P.	August 10	A. L.	July 26
G. P.	August 17	F. O.	August 5
J. H.	August 24	W. D.	August 7
A. H.	August 26	R. H.	July 31
E. N.	August 11	W. S.	July 31
H. N.	August 14	R. T.	August 10
D. S.	August 15	H. S.	August 4
F. S.	August 21	M. H.	August 15
I. T.	August 26		

In one family three out of seven children contracted the disease, two of whom died. In another family, two of three children developed the disease. In another, two out of five and in a fourth family, two out of four children. In a fifth family, two out of six children, and in two other families both of the children in each family were affected.

Of houses in which more than one case occurred not in the same family (tenement and two family houses) there were three cases each in two houses and two cases each in three houses. This gives us a total of twenty-nine cases, or 26 per cent., all of which were associated with one or more cases in the same family or house.

Paralysis.—Paralysis occurred within the first few days of the disease. The average time of the onset of the paralysis was the fourth day. The percentage of paralyzed and nonparalyzed patients was from fifty-eight to forty-two. The day on which the largest number of cases of paralysis occurred was the third day. The result of my observations led me to expect a recovery without paralysis, if the patient showed no signs of it within the first eight days of the disease.

It is of interest to note that eight patients in whom facial paralysis developed had no other paralytic involvement, and but two of the other paralyzed patients had facial involvement. Deducting the patients who died, 55 per cent. of the paralyses involved the lower extremities.

In studying the relation of the paralysis, both in degree and extent, to the cell count in the spinal fluid, I found that there is nothing to indicate either the type, degree or extent of paralysis by this means. In some cases, in which the paralysis was very extensive, the cell count was low, as in Case 2, cell count 43; Case 5, cell count 80; Case 7, cell count 65. In cases in which the paralysis was nil, the cell count was high, as in Case 46, cell count 265; Case 83, cell count 380; Case 84, cell count 392; Case 91, cell count 880; Case 107, cell count 1,160. In taking an average of the cell count, I have found that it did not average as high in the paralyzed as in the nonparalyzed patients.

It may also be here stated that the degree of temperature in no way indicates the amount of paralysis which may or may not follow.

It was occasionally noted that shortly after admission the child would become quite rigid with tetanic spasms. These patients recovered without paralysis.

Deaths.—There were nineteen deaths, or 17.3 per cent. One of these patients died of bronchopneumonia on the twenty-third day of illness. With the exception of two other patients, all died within the first five days of the disease, so that I learned to look for recovery, provided the child did not die within the first few days of the acute attack.

A large majority of the patients died from respiratory paralysis. With one exception stupor set in early, the temperature running from 102 to 105 F. The majority of the patients, also, had difficulty in swallowing — involvement of the glossopharyngeal nerve. Stupor and inability to swallow were invariably looked on as precursors of death.

Immunized Serum.—Fifteen patients were treated with immunized serum. Administration was begun in each patient at the onset of the disease (the first to third day). Two groups of cases were selected for treatment; namely, the first, the nonparalyzed patients with but mild symptoms, the other, the severely affected patients. Seven were selected for the first group, eight for the second.

Of the seven nonparalyzed patients, but one subsequently developed paralysis. It was at first thought that this case was rather promising and that the serum in all probability had been a factor in preventing paralysis from occurring in the other six cases. In this relation, however, in studying twenty-nine other patients who were not paralyzed and who did not receive serum, only five developed paralysis subsequently. This percentage is practically the same as might have been expected had serum been used, so that I feel justified in concluding that the administration of serum in the nonparalyzed patients does not materially affect the prognosis. In the eight severely prostrated patients, six died, and of the two who

recovered, one gradually became more severely paralyzed, the other recovered without paralysis. It is very doubtful, therefore, that serum affected in any way these severely paralyzed patients.

Epinephrin.—This was administered in three patients without any apparent beneficial effect.

After-Care.—All the patients, without exception, on their discharge from the hospital were referred directly to an orthopedic clinic which was organized specifically for this purpose. To this immediate and continuous supervision and treatment I attribute in great part the excellent results which are now being obtained. The plaster of Paris fixation splints which were used in the hospital have been continued in the clinic with the same object in view.

That which has most impressed me in regard to the recovery from paralyses is the fact that long continued rest extending, if possible, over six months' duration in a light fixation splint, such as a posterior plaster of Paris shell, has been the one greatest factor in obtaining the best results.

Massage was begun within two months after the acute onset. It was soon learned that patients so treated did not do as well as those in which the massage was postponed until the third or fourth month.

The greatest difficulty has been to keep the limb at perfect rest after it has recovered sufficiently to allow the child to get about. In those cases in which it has been practically impossible to keep the children off their feet, light, carefully adjusted braces have been supplied. These braces have been furnished simply to prevent deformity in carrying the body weight. Overfatigue in these cases has been noted time and time again, with resultant arrest of progress in the return of function.

In paralysis of the deltoid, I have found the most convenient and comfortable brace to be that of a plaster of Paris splint molded to the side of the chest and extending out at right angles to support the arm. This is bandaged to the body and has proved a practical application.

Muscle Testing by the Balance Weight.—At first, I regarded this measure with a good deal of scepticism. My opinion, however, has now changed since I have learned that in patients on whom it can be applied, the physician will have a much more definite knowledge of the progress of the case and can then more intelligently advise regarding muscular activities. I have in several instances, for example, passed opinion on the extent of the progress of a case by an ordinary manual examination, after which muscle testing by the balance weight having been made, I have recognized decided errors which otherwise it would not have been possible to check up.

A large majority of the patients affected, namely 77 per cent., were under 5 years of age. This necessarily eliminated all but 23 per cent. of the patients, some of whom were not paralyzed, and other of whom died, leaving a small minority of patients in whom muscle testing by the balance weight was applicable. This muscle testing should be made by the same individual each time in order to be accurate.

Muscle Training Exercise.—The exercises have been attempted in all the patients. My experience has been that these exercises are of great value when they can be closely supervised by both the physician and nurse. When, however, this supervision must be left in great part with the parent, the results are not nearly as good, although it may be said that they appear to be better than would be expected if no such muscle exercises were undertaken. I have not employed electrical currents of any kind in the treatment of any of these patients.

Bath Exercises.—A method which I have found to be of great advantage, both in examination and in muscle training exercises, has been bath exercises. For this purpose, I have had installed in our clinic a bath 4 feet by 3 feet. In this bath, the slightest response of returning power in a muscle or group of muscles can be detected and recorded. In addition to this, the patient is encouraged to attempt and obtain motion which would otherwise be impossible — and this without the slightest overfatigue.

Thirty patients have been discharged from our clinic, having completely recovered and being in need of no further supervision. This number represents 33 per cent. of all the patients, exclusive of those who died. To these, I may add another 26 per cent. who will in all probability be discharged as cured within six months' time. This leaves 41 per cent. who will require further treatment. Of these patients, 26 per cent. are able to walk comfortably, but 15 per cent. are unable to do so. Of this 15 per cent., however, one half of the patients are 2 years old or under; which accounts in part for their disability.

CONCLUSIONS

1. A reliable early diagnosis can be made in a large majority of the cases.

2. We are unable to prognosticate regarding the subsequent severity of the paralysis, either by the acuteness of the febrile stage or any laboratory findings thus far submitted.

3. When death occurs, it takes place with few exceptions during the first few days following the acute onset.

4. Treatment outdoors during the convalescent stage is most beneficial.

5. In my experience, immunized serum treatment has not proved efficient.

6. Although there is nothing to disprove the possibility of an insect carrier, the evidence herewith submitted would sustain the assumption that poliomyelitis is a contagious disease.

7. Although muscle testing by balance weight is applicable in only a small percentage of the patients, in these patients it is of much value.

8. Continuous supervision is most important.

9. Continued electrical treatment is not essential for the recovery of lost muscle function.

10. Bath exercises in relation to muscle training form one of the most practical and useful lines of treatment that can be followed out.

11. Complete rest extending over six months is one of the most important factors in obtaining perfect return of function.

12. Overfatigue is of the greatest detriment to improvement, and is most difficult to guard against.

13. Braces should be made as light as possible and should be supplied immediately when body weight-bearing tends to produce strain or deformity.

14. The percentage of paralyzed and nonparalyzed patients in an epidemic may be expected to be about 58 per cent. paralyzed, 42 per cent. nonparalyzed; or, excluding those who died, 49 per cent. paralyzed, and 51 per cent. nonparalyzed.

40 East Forty-First Street.

THE ORTHOPEDIC TREATMENT OF ACUTE AND CONVALESCENT POLIOMYELITIS *

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So much has been written during the past year of poliomyelitis that one naturally hesitates to add to the literature on the subject; and yet the feeling of certainty that the problem is much bigger than anything so far written or said, and the hope that out of our experiences at the Seaside Hospital there may come a little help in the efforts to meet the challenge of this terrible disease, impel me to briefly report the results of the work done in that institution. It is, of course, to be understood that this is a preliminary report only.

I feel quite confident that soon the questions of specific agency and the mode of transmission of the disease will be settled, but so far orthopedic surgery is the one branch of medicine that has contributed something definite to the problem of curing crippled and deformed children. Out of the maze of uncertainty and wild theories, one fact stands out clearly: We have prevented and corrected deformities, and we have hastened the restoration of muscle power.

That is good, but the time has now come, if we are to be of the most service to humanity, for us thoroughly to recognize the fact that a large percentage of the deformities that heretofore have given us the opportunity of appearing in the more spectacular rôle of operative surgeons would not have occurred if the proper treatment had been carried out in the acute and subacute stages. Clever operations designed to correct deformities is not enough; we must prevent these deformities; and what is of vastly more importance, we must prevent permanent paralyses.

We must not be satisfied when in one, two or three years, by our muscle reeducation, we have opened up new paths of conduction and thus brought about a partial or complete restoration of muscle power. We must so treat the child in the acute stage that the normal paths of nerve conduction will not be destroyed.

While the major part of this paper is a report of the work done at the Seaside Hospital in the treatment of the disease in what is known as the convalescent stage, I feel that by far the most important thing I can do is to insist on a plan of treatment of the acute stage which I think will render much of this tedious and uncertain work unnecessary.

I wish to observe, first, that the division of the ordinary spinal type of the disease into the acute, convalescent and chronic stages is not sufficiently accurate and does not correctly correspond with either the pathology or the clinical course of the disease. Rather, it seems to me that a better division would be into acute, subacute, convalescent and chronic stages. If I were obliged to make an arbitrary time division of these stages, I should say that the acute stage covers the first four weeks and corresponds to the active inflammatory process in the cord, and lasts until the cells that have been disabled by effusion have recovered. The subacute stage begins at the fifth week and extends to the time when the cells that have been disabled by light hemorrhage have cleared up. This I should place at the end of four months. The convalescent stage begins at the fifth month and extends to the time when the motor cells that have been disabled by deep hemorrhage have recovered. This I should place at the end of two years. The chronic stage begins at the third year and represents the permanent paralyses of muscles receiving their nerve supply from the motor cells destroyed by toxemia.

A knowledge of the pathology of the disease and of the physiology of the nervous system would seem to indicate that the proper treatment of the acute stage is the inhibition of afferent impulses to the sensory cells of the central nervous system, thus making it impossible for the diseased motor cells in the anterior horn of the cord to be stimulated through the reflex arc. A motor cell that is diseased through effusion or hemorrhage should receive the same rest that we attempt to produce in any other diseased structure. To produce this motor cell rest it is not sufficient to inhibit the afferent impulse from the muscles involved or even of the member involved. All afferent impulses from the entire body, those arising from the surface of the body as well as from the deeper structures, should be checked. There can be no question that cells which are disabled by effusion and which should resume their function by the end of the acute stage, if they receive the proper rest, are hindered in their recovery and further disabled by attempts to functionate. And in the same manner cells which are disabled by light hemorrhage and which should resume their function by the end of the subacute stage are further diseased by use and converted into the more seriously diseased type of cell.

I think it is agreed that the cells destroyed by toxemia form a small percentage of the cells affected, probably not over 10 or 12 per cent., and yet we have had permanent paralyses vastly in excess of that. What does that mean? It means simply that by our lack of understanding of the conditions present and the indications to be met, we, by our meddlesome efforts to assist Nature, as we think, are pouring impulses, or allowing them to be poured, into a diseased cell that has its outlet blocked, thus either destroying it entirely or converting it into a more seriously diseased condition. Any end-result that carries a permanent paralysis in excess of the cells destroyed by toxemia is a sad commentary on our treatment or lack of treatment. Early in the work at the Seaside Hospital in treating the disease in the subacute stage, we proved to our entire satisfaction the beneficial results following complete immobilization of the entire body. I am quite sure that the results will be even more striking if this plan of motor cell rest is applied in the acute period. Our method of obtaining this result in the subacute stage was by encasing the child in a plaster bed, separated so that it could be removed if necessary. It was really remarkable how comfortable it was to the patient and how much struggling and fear it overcame. I have not had a large opportunity of using the method in the acute stage, but in the future if the chance should come, I shall treat every child, as soon as the diagnosis is certain, by immobilization in a plaster bed, putting it in a dark, quiet room, covering the ears to keep out all sounds, and with a careful attention to diet and excreta.

CONVALESCENT STAGE

Seaside Hospital was opened, Sept. 18, 1916, for the hospital after-care treatment of the disease. It grew

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out of the desire of the "Brooklyn Children's Aid Society" and some public spirited men to help meet the emergency that followed the epidemic of last summer, and the desire of Dr. Truslow and myself to put into practice some ideas we had as to the proper treatment of the disease, chief of which was the firm belief that in the seriously paralyzed children the treatment should be hospital rather than home or dispensary. There have been admitted to date 146 children, all seriously paralyzed. Twenty-four of these at admission were still in what we consider the subacute stage. It is worthy of note that these have made a more satisfactory improvement than those admitted later in the course of the disease.

TABLE 1.—RESULTS IN ONE HUNDRED AND FORTY-SIX CASES

	No.
Discharged wearing braces and practically recovered	5
Left within a day or two of admission	5
Here too short a time to be included in an estimate of our results	10
Cases in hospital long enough to be included in our estimate	112
Cases of the encephalitic type—"spastics"	14

TABLE 2.—DISTRIBUTION OF PARALYSES

	No.
Paralysis of one arm	7
Paralysis of both arms	6
Paralysis of one leg	14
Paralysis of both legs (paraplegia)	68
Paralysis of one side (hemiplegia)	0
Completely paralyzed (both arms, both legs, back, abdomen, neck and chest)	17
Paralysis of one side of face	2
Paralysis of speech center (one has perfectly recovered, one just beginning to say a few words)	2
Backs involved	86
Backs involved, with marked curve	42
Abdomens involved	66
Abdomens involved, with large globular bulging of some part of wall	7
Paralysis of sphincters	5

In the list of cases in Table 2 it should be particularly noted that we had no case of hemiplegia, though we have had three cases with the arm of one side and the opposite leg paralyzed.

TABLE 3.—DEGREE OF IMPROVEMENT

	No.
Very great improvement	64
Fair improvement	42
No improvement as yet	5
Died, from pneumonia	1
Abdomens improved	61
Of these very great improvement in	5
Abdomens unimproved as yet	5
Backs improved	86
Of these, very great improvement in	8
Of the 14 spastic cases:	
Improved	8
No improvement as yet	4
Died, both from pneumonia	2

On admission, the child is carefully examined and the condition of every muscle thus recorded on the history chart:

N, normal.

—1, weak, but can lift and sustain moving segment against gravity.

—2, can lift but cannot sustain moving segment against gravity.

—3, cannot lift moving segment but can assist.

—4, cannot assist, but examining fingers feel response in tendon.

—5, completely paralyzed.

Table 4 shows the present condition of some of the more important muscles that were marked — 5 on admission.

It will be noted that of these important muscles we have had the most marked improvement in the deltoids and the least improvement in the quadriceps. The same rule we have found to hold in the case of these same muscles marked less than —5 on admission. We feel particularly gratified in the improvement we have had in the deltoids. In this connection we have found that all the muscles of the shoulder recover in about the same degree as the deltoids with the exception that the external rotators, supraspinatus, infraspinatus and teres minor, seem to be slower. This fact will be noted later. Of forty-six paralyzed shoulders, thirty-two of which are noted in Table 4 as —5 deltoids, all but two already show a marked improvement, and we feel quite sure eventually will be useful joints.

TREATMENT

I have already discussed the problem of the treatment of the acute stage. I repeat that the bringing about of a condition of motor cell rest is the thing to be desired. If better methods than I have indicated can be thought of, they should be used. However it is brought about, I am quite sure that it will mark the most important advance made in the treatment so far, and will save many children from the crippling and deforming results that heretofore have attended the disease.

In the subacute stage the treatment is rest and support of paralyzed muscles and the prevention of deformities. The same general rules are to be followed as in the treatment of the convalescent stage, with one exception.

In discussing the treatment of the convalescent stage, which is the work that has occupied practically all of our time, the treatment followed and some of our more important conclusions are so related that it is impossible to discuss them separately. I wish to observe that:

1. The most frequent paralyses, in the order named, are anterior foot muscles, quadriceps, glutei, hamstrings, deltoids, hip flexors, internal rotators of the thigh, and external rotators of the shoulder.

2. The treatment of the spastic cases is most unsatisfactory so far, but rest is indicated. We have found that attempts at massage and muscle training are neither agreeable nor beneficial.

3. A stretched muscle will not regain its tone. This is very important and is the key to all treatment. Every weakened muscle, the dorsal flexors of the ankle, the quadriceps, the deltoids, or the muscles of the back and abdomen should be treated with this fact kept in mind. We attribute our results in the treatment of deltoids to the fact that the muscle has been kept in a relaxed position continually. This we have done with a brace that elevates, externally rotates, and abducts the arm. Whether the elbow is extended or

TABLE 4.—PRESENT CONDITION OF MUSCLES MARKED MINUS 5 ON ADMISSION

Muscle	Number	Improved from —5 to —4	Improved from —5 to —3	Improved from —5 to —2	—5 to N	Unimproved as Yet
Deltoids	32	8	8	10	4	2
Glutei	69	24	19	9	9	8
Hip flexors	64	13	23	11	12	5
Quadriceps	84	19	27	20	8	10
Hamstrings	71	20	19	14	10	8
Gastrocnemius	16	6	2	3	2	3

flexed depends on the condition of the biceps and triceps.

4. Many muscles marked —5 on admission have been found to be cases of muscle fatigue and not true paralysis. This we have proved time and time again in the case of feet that have been in a position of valgus for four or five months. After putting the foot up in plaster for two or three weeks in position of marked dorsal flexion and inversion and then removing the cast, we have been surprised to find very good anterior and posterior tibial muscles.

5. Contrary to the plan of getting the children up as soon as possible we have followed the opposite course. We are convinced that many backs are injured because the child is put in braces and encouraged to walk. Even though some particular muscle or set of muscles can be braced sufficiently to allow the child to walk, it should not be done until it can be done without injury to other weakened parts. The effort should be to bring about a symmetrically recovered whole. If the child receives the proper massage and muscle training treatment, prolonged rest in bed can do no possible harm.

6. The treatment is hospital rather than home or dispensary. It is impossible to carry out the treatment that follows an appreciation of the law that a stretched muscle will not regain its tone by taking the child to a dispensary every other day. Casts will be loosened, braces will be allowed to slip and supports will need readjusting even with the most frequent watching.

If we have had any superior results in our work, it is not that we are more capable orthopedists than others or that our muscle trainers are more skilful than others; it simply represents the superiority of hospital treatment over any other plan that does not give the same careful and constant attention to details.

7. Electricity has no place in the treatment of the disease before the chronic stage, and even then we question its benefits.

8. Muscle training or muscle reeducation is very valuable in the convalescent and in the chronic stages, but not indicated in either the acute or subacute stages. It is illogical to attempt to build a new communicating line from brain to muscle while the probability remains that the old line will do the work. This is the one exception we noted in speaking of the treatment of the subacute stage. It may do harm if used early in the disease by stimulating the diseased motor cells that require rest to bring about their recovery.

9. A reference to our statistics will show that out of 112 cases, eighty-six showed a very weakened condition of the back muscles, and forty-two presented a decided curve. We feel quite sure that poliomyelitis, either frank or unrecognized, furnishes us the reason for most of our cases of scoliosis. We do not feel that faulty posture alone causes scoliosis. It may be the exciting cause, but in our opinion a careful examination into the history of the case will disclose the fact that there has been a predisposing cause, and with the exception of those cases caused by empyema, rickets or asymmetry, we believe this predisposing cause will be found to be due to a disturbed relationship between the muscles of the back from a previous attack of poliomyelitis. In speaking of the treatment I have attempted to state general principles rather than to give bare statistics.

CONCLUSION

I wish to repeat, as emphatically as possible, these two points:

1. Treatment of the acute stage should have in view the bringing about of a condition of motor cell rest.

2. All treatment of weakened or paralyzed muscles, in whatever part of the body they may be, should be based on the law that a stretched muscle will not regain its tone, and methods and appliances used that will keep the muscles in a position of constant relaxation.

TREATMENT OF ANTERIOR POLIOMYELITIS AT FORDHAM HOSPITAL *

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The recent epidemic of anterior poliomyelitis in this city with the tremendous number of unfortunate victims put a special task on the general hospitals in which orthopedic clinics are held. At the regular orthopedic hospitals, there was no need for making special preparations for treating the anterior poliomyelitic patients from this epidemic during the convalescent stage, for they always had such cases. The general hospitals, while they had orthopedic clinics, had to make special provisions to meet the vastly increased demands. As we had such a problem in Fordham Hospital, I will first review briefly the provisions made here.

FACILITIES AT FORDHAM HOSPITAL

There was no adequate room in the hospital to spare for administering treatments to these patients, but we had plenty of ground facing the Bronx Park. We constructed a large tent with a wooden floor and steam pipes (Fig. 1). The location of the tent outside of the hospital helped also to avoid the interference of these small cripples while passing through the general dispensary rooms. The advantage of a tent in summer need not be elaborated on but, even in winter, we found that the sun shining on the canvas helped to warm the tent very quickly. During the entire season we missed treatments only about five times owing to the strong wind then prevailing, especially as the hospital is located on a high level surrounded by parks. We really feared the wind more than the cold. Few of the children ever caught cold in the course of the treatment. The inside of the tent is cheerful and has an excellent effect on the little children (Fig. 2). They run around and enjoy themselves and do their exercises freely.

Inside this tent we placed massage and examining tables and electrical apparatus. At one end we have special toys, large and small, for exercising the younger children and for making the time more pleasant for the older ones. Often an older child will help a younger one use the toys, and thus double benefit is derived. Such provisions, in my opinion, can be made in any general hospital on short notice.

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* Because of lack of space, this article is abbreviated in THE JOURNAL by omission of the illustrations. The complete article appears in the Transactions of the Section and in the author's reprints.

The treatments are given by experienced masseuses and muscle educators. At least one physician, a member of the orthopedic staff, is always on duty in the tent to see that the massage and exercises are properly administered, not overdone and, if necessary, to change the orders. We have also a special social service nurse who devotes her entire time to this work.

REGULATIONS OF THE CLINIC

As orthopedic patients are in the habit of roaming from one clinic to another, and as we desired to watch the results carefully, we have established the following regulations, which proved practical:

1. No patients are permitted to attend any other orthopedic clinic during the time that they are receiving treatments at our hospital. If the social service nurse discovers that they do attend another clinic they are informed either to stay with us or to go to the other place. At the beginning, we lost many patients; namely, those who have the tendency to migrate to many hospitals, while the more settled stayed with us. Of course, we have somewhat the advantage that we are away from the center of the city, and thus the patients are less tempted to visit other hospitals.

2. On admission every child was carefully examined and the mother was told that the child could not be assigned to us unless she was willing to comply with our orders. The child had to be under our control and the treatments would be changed only when we considered it necessary. The distrustful mothers left us at the beginning, because of what they considered "strict discipline," while most of them realized it was for the child's welfare and remained with us.

3. Every mother had to consult the physician in charge of the tent at least once every two weeks, reporting to him then how the child was getting along at home and to receive from him further instruction. Of course, her reports were accepted with due consideration to her intelligence. At the beginning, to our surprise, some mothers were not able to see the benefit of this additional burden and had to be urged to come. Most of them, however, were so interetsed that they used to wait anxiously for their turn to consult the physician. Within a short time the mothers learned that, if they noticed no improvement and if the child complained of any trouble of an orthopedic nature, they could come to the clinic and ask the social service nurse to make an appointment for the physician to examine the child. No child was examined except in the mother's presence.

4. After the first three months, no patient was admitted to the clinic who had attended another hospital unless he was transferred to us from there, or if the Society on After Care found it necessary to transfer the patient to us. Thus practically most of our patients were with us all the time and, if transferred from another hospital, their records could be traced. We were also able to prevent them from coming just for examination and then returning to the previous hospitals.

5. The child was examined in the regular orthopedic clinic and then sent with the chart to the tent. There the attending physician, by consulting the chart, informed the masseuses what muscles were paralyzed and instructed them what exercises to give; thus the masseuses received personal instruction in reference to each child.

6. The mothers have not been allowed to choose the masseuse who was to treat their children. While it may be of advantage to have one masseuse treat the child all the time, as in private practice, it seems to me that for dispensary patients it is of extreme disadvantage. It causes the masseuse to be partial, leads quite often to bribery and jealousy and, besides, in the absence of that particular nurse the child is left without treatment. Our arrangement has been that all the masseuses should acquaint themselves with each patient. For that reason the physician in charge has frequently changed the masseuses to different tables.

METHODS OF TREATMENT

As far as examinations are concerned, we adhered closely to Dr. Lovett's method. Even with infants we were able, with a little patience, to isolate the group of muscles that were paralyzed. We have not found it necessary to resort to the use of electricity for diagnostic purposes. Before we started the treatments, we decided to use for the first six months massage and muscle training only and then, if necessary, to resort to electricity or, at that time, to choose cases for testing the value of electricity compared with massage and muscle training.

We have mapped out that plan for the following reasons:

1. We were in full accord with Dr. Lovett's statement that electricity was valueless and that excellent results might be obtained by proper massage and muscle training.

2. At the previous epidemic, I had used electricity alone and likewise in combination with massage and muscle training for a period of six months on more than a hundred children and did not see any benefit derived from the electricity.

3. The use of electricity is quite often resorted to at home by many parents without any scientific knowledge, while muscle training is usually applied by one who is competent to do the work. Even if the parents watch, they easily understand that special training is required for that kind of treatment and they will not rely on their own limited capacities. When certain exercises are shown them, they follow those with greater interest than the electrical treatment and return frequently to receive further instructions.

4. The mental condition of the youngsters is to be taken into consideration. When one comes to our tent, where from thirty to forty children of different nationalities are being treated, one seldom hears a child cry, while in some clinics, the sight of the electrical machines is enough to frighten them. This point was particularly noticed by all the social service nurses who visited our clinic.

As all the patients showed marked improvement within the first six months, we did not feel justified to experiment on them. We left to others to test the value of electricity, and we were willing to follow their records and compare with ours. Fortunately, we had a chance to reexamine six patients. They returned after three months, having left us to get electrical treatment. We found less improvement in them than in similar cases treated at our clinic.

At one time we had decided to follow Dr. Lovett's experiment in choosing one side for electricity and the other for massage and muscle training, but the mothers had become so used to the undivided attention given to each child while using muscle training and had felt so delighted with the results, that we

were certain we could retain them until the patients were cured and thus be able to report carefully on the results of the foregoing methods. Though many mothers left us at the beginning because they wanted electricity, many new patients came to us from other clinics for the sole reason that they heard we were able to obtain improvements without resorting to mysterious remedies that frighten the children.

The treatments were given three times a week. Only on rare occasions were they ordered daily for from two to three weeks in succession. If the child was very ill or home conditions bad, he was admitted to the hospital. The massage given was very light, from five to eight minutes on a limb, effleurage being used first, and then kneading, alternating with slow friction from periphery to center. We found that no child complained of the massage. If it was painful the massage was diminished. We had many patients who were previously treated elsewhere with vigorous massage and did not improve, while with light massage the pain discontinued and the improvements were rapid.

In muscle training, we followed the Wright system advocated by Dr. Lovett in his book on infantile paralysis. We found that muscle training can be applied to infants even below 2 years of age. Many infants from 13 to 14 months old could understand the order of "up," "down," "in" and "out." Some of them who were able to talk early even repeated the words as the masseuse gave the order. For some, we used toys to attract their attention. Of course, when the child showed insufficient intelligence, we gave passive motion, while at the same time repeating the orders, so that the meaning could finally be grasped.

We resorted to braces freely. Almost every shoulder patient was put in a brace, for we felt that the danger of stretching the deltoid was too great. Only two children improved without the shoulder brace. There were a few for whom these were not ordered at the beginning. After from six to eight weeks we found that they did not improve as well as those who had them. At the start they had to sleep in them; then as they improved, the braces were worn only during the day, and later on during part of the day. For the lower extremities, no brace was ordered before four weeks unless a deformity was present or feared. After receiving treatments for four weeks, the child was reexamined, and in most cases it was possible then to decide whether or not the patient had improved. Sometimes we had to reexamine the patient before the braces were given. We found that the children with the braces which allowed them to walk early improved faster than those without, and that atrophy was present to a lesser degree.

We urged the proper use of the limbs and watched not to overuse them. As the mothers had to report every two weeks, we asked them particularly not to overuse the muscles. It was interesting to note that in many children with similar paralysis of both legs, when only one limb was put in a brace and the other limb used as a control, the leg with the brace improved quickly and showed less atrophy. This seems to be due to improper and excessive use of the leg without the brace. The mothers quite often begged to put a brace on the second one. In many cases the brace was removed after three or four months. It became evident that braces were helpful when only used for a short time.

ANALYSIS OF THE CASES[1]

In the first hundred cases there were forty-three male and fifty-seven female patients. The average age was 4 years, the youngest being 11 months and the oldest 18 years. Other data are given in Table 1.

TABLE 1.—CONDITIONS PRESENT IN ONE HUNDRED CASES

Description	Number
Patients who on examination showed no deformity	7
Patients with paralysis of the face	10
Paralysis of one upper extremity	3
Paralysis of one lower extremity	26
Paralysis of face and one lower limb	1
Paralysis of face and one upper limb	1
Paralysis of spine and one lower limb	2
Paralysis of abdomen and spine	2
Paralysis of both upper limbs	1
Paralysis of both lower limbs	17
Paralysis of one upper and one lower limb	5
Paralysis of one upper and two lower limbs	5
Paralysis of one lower and two upper limbs	1
Paralysis of one upper and one lower limb, abdomen and spine	1
Paralysis of one upper and two lower limbs, abdomen and spine	1
Paralysis of two lower limbs, spine and abdomen	12
Paralysis of four limbs, spine and abdomen	5

Ten of the patients were so sick and the home conditions so bad that they were admitted to the hospital. There were a few more who needed hospital care, but the children had just returned from forced quarantine and the parents wanted to have them at home. As we were not anxious to force any of them and, seeing that they may be justified in seeking home care, we arranged to have them brought by the transportation bus of the Society of After Care of Anterior Poliomyelitic Cases.

Braces were applied to thirty patients. Deformities were not as frequent as in the previous epidemic. Most of the children, as known, were treated in the hospitals at the acute stage by orthopedists, and deformities guarded against. I had only eight cases in which contractures had to be corrected before exercises could be given and braces worn.

The results of eight months' treatment (October, 1916, to June, 1917) on the first hundred patients that were admitted to our dispensary are given in Table 2. Of the hundred only ninety patients needed treatments; the other ten were ordered to come only for observation. Of the ninety patients, twenty-one left us at the beginning, of their own accord. This, in our opinion, is the average result that one could expect in the first eight months.

TABLE 2.—RESULTS OF TREATMENT

Condition	Number	Percent.
Patients recovered	8	11.6
Showing marked improvement	23	33⅓
Showing moderate improvement	31	44.9
Showing slight improvement	7	10.1
Patients who did not improve	None	
Patients who became worse	None	
Patients who could dispense with the braces	4	13.3
Patients still wearing braces	26	86.7

CONCLUSIONS

1. The best results can be obtained if each patient is studied individually and controlled from beginning to end. This can be done even in a clinic by taking enough interest in the children.

2. In light massage and muscle training, we have all the facilities for improving these patients without resorting to the mysterious electricity.

3. It is easier to get the assistance of the mothers when electricity is not used than when it is used.

4. The benefit derived from proper use of braces far outweighs the atrophy which it produces. They

1. This analysis is given to show general extent of paralysis in the first hundred cases.

are especially useful in deltoid paralysis. Braces should be discontinued as early as possible.

5. If proper orthopedic treatments are carried out, there will be marked improvement within a short time, and deformities will be prevented.

6. The earlier the children begin to walk, the quicker they improve, provided, of course, they do not use the limbs excessively.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. OGILVY, EBRIGHT AND BOORSTEIN

DR. CHARLTON WALLACE, New York: The treatment of infantile paralysis during the acute stage, in my opinion, consists in rest. Protection in plaster of Paris during the stage of pain and tenderness is essential to relieve the patient from discomfort. During that time fresh air is, I believe, a necessity, as for the tuberculous patient. Good general nursing and hygienic surroundings are also very important. Some attention should be paid, at this stage, to the bowels, in order to clear up congestion anywhere. During the apparent paralytic stage—and by this one means the stage when many muscles seem to be paralyzed—the use of braces is preferable, when intelligently applied. However, even bracing not intelligently applied is better than no bracing at all. As the patient progresses and gets around, the amount of bracing can be cut down. Braces not only help the patient to use the extremities physiologically, but also prevent contractures. If the braces are made properly, with the weight evenly distributed, and with proper joints, corresponding with the joints of the patient, the apparatus need not be cumbersome.

The bath exercise is an exceptionally good thing. It has been used for many years in our institutions. We have seen some patients who showed no power in certain muscles, but who, when put into the water, were able to demonstrate motion in these muscles. That is probably accounted for by gravity having been overcome by the water's buoyancy. If the patient displaces his weight in water, he has a little more voluntary control over muscles that are apparently not useful.

One believes that any child that has infantile paralysis should have the benefit of anything that anybody says is helpful. I therefore use massage and muscle training, which are assets. The questionable asset is electricity. Whether or not it is beneficial, no one can prove; but one can prove just as much about the beneficial effects of electricity as one can that any treatment is beneficial, for we know that all patients improve during the first year or year and a half, no matter what treatment is employed.

The prognosis, unfortunately, is the thing that the mother is most concerned about; and no one can give the prognosis of a case of infantile paralysis until a year and a half or two years have passed. Then the damage is done, and we know what muscles are going to be paralyzed.

DR. WALTER TRUSLOW, Brooklyn: The detail of treatment is what I find of most interest. I wish to discuss the relative value of entire hospital care for these cases, dispensary control of home muscle-training treatment, and dispensary control with dispensary muscle-training treatment.

When infantile paralysis struck New York City last summer, it was so thoroughly frightened that it made its fright known, not by falling under the load, but by doing everything possible to meet it. The more we look back over this period, the better we shall realize the debt of gratitude we owe to our health commissioner, Dr. Haven Emerson. He is entitled to thanks for having put forward the orthopedic surgeon as the one best qualified to supervise the after-care. We had 1,800 children at the Brooklyn Contagious Hospital, where we began to use protection almost from the first. Then Brooklyn had the opportunity to secure Seaside Hospital for immediate follow-up treatment of these cases. A public spirited man made it possible to treat 100 children there. I have had charge of this group. It was a wonderful opportunity. Dr. Ebright has shown the difference in the results in the children who were with us there from the first, as compared with those who came later.

We orthopedic men went into this epidemic with the great belief that we could prevent deformities; and that if we did so we should be doing much toward the permanent usefulness of the parts involved.

I do not want to be misunderstood as saying that we have not learned anything new from this epidemic; for we have, of course. But we have had the good fortune to see our previous beliefs verified to a great extent this year.

I believe that entire hospital care is the ideal method. Absolute protection is the first essential, and this, plus progressive muscle training, is the correct treatment. Nowhere else than in the hospital can this be attained. Our workshop is one of the important features of the place. The child is sent there, and the particular problem before it is attended to at once. If we sent for an elaborate brace, it would be costly; and, by the time it arrived it would not be adapted to the child's needs of that particular period. When the child recovers more we find what its need is then, and apply the apparatus adapted for it.

DR. HENRY B. THOMAS, Chicago: I want to emphasize the importance of the care of the child in the acute stage, during the hospitalization period, which last summer in Chicago was five weeks. It so happens that when the cases were brought to Cook County Hospital they were properly put on the contagious side. They were, however, also seen by the orthopedists. At this time it occurred to us that it was very important to take care of the child in this early, acute stage of the disease. If a limb or the body was moved, producing pain, we thought the muscle was injured and probably the nerve, and thus the child was given less opportunity to regain the normal muscle power than if we had left the muscles quiet. We found that when the child was bathed every day, even with a sponge, and turned over once or twice a day, with acute pain, the result was bad. The child did not do so well as when left absolutely quiet. These children will do best without the sponge bath if in giving it there is pain. If one can get the light massage that comes from the bath treatment, and can get the child in and out from the bath, even in the acute stage, without causing pain, we believe that one secures the most delicate massage there is, from the change in pressure, and that this will help the child's musculature. We advised in some cases that the children be put on a Bradford frame, that the entire frame be immersed in the warm bath, even in the early stage. Some of our children at first had heavy woolen stockings placed on their feet, though it was August; we had in mind the chronic infantile foot in cold weather. In the early stage this is not necessary in most cases.

DR. WILLIS C. CAMPBELL, Memphis, Tenn.: It is true that we have learned nothing very new from this epidemic, but the older methods have been better systematized, and we are better able to teach the profession as a whole the necessity of early orthopedic treatment in these cases. What is most important is, of course, as we all know, the prevention of deformity; and this should be attended to as early as possible. Massage and muscle training should, of course, not be given until after all acute symptoms have subsided. I have found that individual muscle training is far superior to instruction in classes, and that the child should receive daily attention. Dr. Truslow has brought out the fact that we may obtain better results by keeping the children in the hospital for an indefinite period. This is because the children have special care and daily treatments. Prolonged rest after the onset of the condition, and long after the acute symptoms have subsided, is usually necessary. Too early walking is to be deplored. The child should be kept off his feet for six months or even a year, in order to prevent deformity. Proper braces and splints must be applied. Deformity may often be corrected without tenotomy or other surgical procedures, as late as one year after onset of paralysis, by successive casts or adjustable braces, with appreciable return of power to the overstretched muscles, as well as restoration of proper mechanical balance.

DR. JEFFERSON D. GRIFFITH, Kansas City, Mo.: May I ask the gentlemen in closing the discussion to tell the temperature curve on the initiation of this disease, and also the blood count in this condition? The reason I speak of this is that it seems to me that we ought to broaden out, and prevent, if possible, the bad conditions that we obtain, by learning all that we can in regard to the care of these cases. It seems to me that if we can meet other infections, such as staphylococcus and streptococcus infections, that disturb metabolic processes to the great extent that they do, we should be able to control poliomyelitis. In this disease we evidently have an infection. We find that many infections lead up to a condition of metabolism termed acidosis; if we could find anything that would ameliorate this condition, it would prevent death during the acute stage. We know that in a marked disturbance of metabolic processes in infections, we can, by proctoclysis of hypotonic salt, sugar, or soda solution, 8 to 10 drops to the minute, bring about a condition that will reduce the ordinary blood count—not only the leukocyte count but the polymorphonuclear count—rapidly. We may be able to reduce the results of the acute infection in this way.

DR. WALTER G. STERN, Cleveland: A topic that has many practical applications is the difficulty with which the parents and, through them, these paralyzed patients, are controlled. To me, the situation in New York in the matter of hospital and dispensary abuse is untenable. I found, in the three days that I have been here this trip, many free patients in the dispensaries who confessed to the attendance of private physicians at their homes, or to the fact that they had already that day been to two other free dispensaries for advice and treatment. I think that a charities clearing house would prevent this sort of thing and put the patients under better medical control, which Dr. Ebright demonstrates is so necessary.

Dr. Thomas of Chicago, in a paper in THE JOURNAL, said, last August, that one of the principal things in the treatment of the subacute stage was the "avoidance of fatigue"; it would be a great step forward if we could have our patients under better control and prevent their running from one dispensary to another. As it is, they go from one man, who says, "Keep the patient off his feet, because it will exercise the stronger muscles at the expense of the weaker," to another man, who says, "Keep the child on its feet as much as possible." I think that "the home control" is as important a measure of treatment as anything I have heard mentioned.

DR. EUGENE ROSAMOND, Memphis, Tenn.: In regard to house control of these patients, Dr. Wallace has, to my mind, given us the best hint. The general public does not know that electricity is not useful, and any man who fails to play with electricity, at least in some way, is going to lose the control of these patients, especially in the families of the well-to-do. The surgeons and general practitioners, and often specialists along all lines, will be consulted by the family; and if electricity, if massage, if anything that every one knows is not used in some way, under the careful supervision of the man in charge, we are going to lose the control of these patients. It is just as reasonable to expose an acutely inflamed, painful muscle to manipulation, massage and electricity, or anything that hurts, as it is to expose an acutely inflamed eye to the sun. Absolute rest for too long a time, rather than not enough time, is the keynote in the treatment of the acute condition. Later, although I am a pediatrist, I believe in turning the cases over to the orthopedists. But I just want to say that we have to do a little bit of everything, carefully supervised, so as not to injure and overfatigue an acutely inflamed muscle and nerve cell, until such time as nature can discover another way around for the nerve impulse, or can repair the damaged nerve line.

DR. PETER BASSOE, Chicago: Apropos Dr. Ebright's remark that stretched muscle loses its tone, galvanic treatment by means of an interrupter electrode does produce contractions in flaccid, paralyzed muscles which cannot be made to shorten themselves in any other way. Hence, while admitting that we cannot expect much from electric treatment in these cases and that too much has been claimed for it in the past, yet I believe that the pendulum is now swinging too far the other way when some of the speakers deny any virtue at all to electric treatment.

DR. CHARLES OGILVY, New York: We are asked very often, not only by the laity, but also by our fellow associates in the profession, whether we have made a great deal of progress in relation to the treatment of infantile paralysis. I think we have obtained a great deal of knowledge on the subject. We are continuing to gain more. We have learned more of the benefit of rest, and emphasis has been laid on that; and we also have learned about the continuous control of the treatment. The basis of treatment is, first, prevention of deformity, and second, return of function. To these the orthopedist is particularly adapted; and it should be our work to control these cases from first to last, with the association and cooperation of others interested. We should take this responsibility, and if we do so, we shall obtain better results than heretofore in the treatment. I am sure that the results we are getting now will show that we are obtaining much better results than in previous years.

DR. E. D. EBRIGHT, Wichita, Kan.: As orthopedists we have been insisting all the time that the treatment of these patients should be handed over to us from the very first. I think our attitude is correct, but we owe it to our patients that our treatment should be based on a correct understanding of the pathology. Any stimulus to the muscle should be intrinsic, rather than extrinsic. I mean by that, that massage, muscle training, electricity, or any other form of stimulation from the periphery that is supposed to cause the diseased motor cells to functionate through the reflex arc, should not be attempted until the cells are sufficiently recovered to carry out their part of the reflex act without damage.

A stretched muscle does not regain its tone for two reasons: first, because of the trophic disturbances present, due to a continuously stretched condition, and second, because of the fact that a muscle so stretched is sending sensory impressions to the posterior horn of the cord that are in turn transmitted to the diseased cells in the anterior horn. These then attempt to functionate. What we are really doing is producing a vicious circle. That is why rest is so very important in the acute and subacute stages. These children should be constantly supervised. If you put a brace or cast on a baby, the chances are that in an hour, or even a half hour afterward, the child will have it off. If you send these children home, telling the parents to bring them back every day, they will not come back supported as they were when they left. It is impossible to keep them so unless they are constantly supervised.

Out of thirty-two deltoid paralysis cases, all but two have regained some degree of muscle power. We think that in thirty of these thirty-two deltoids we are going to have useful joints, not by putting the arms in a position in which the external rotators are on the stretch instead of the internal; the arms should be kept at more than a right angle and rotated outward to protect the external rotators.

DR. SAMUEL W. BOORSTEIN, New York: Dr. Wallace spoke of fresh air. Administering treatments in a tent instead of in a dispensary affords the children the opportunity to be in the open air for three or four hours. In encouraging walking, parents are told how many times and how often the paralyzed muscles should be used daily, and also for how long weight-bearing should be permitted. If explanation is not given to the parents, they will permit the children to walk and overuse the muscles. If one puts on braces, the children will not use their feet to excess. At the same time it has a good psychologic effect, for walking is the natural exercise for children.

With reference to hospital care, I do not think that parents can be induced to leave the child in the hospital; neither is it necessary, for home surroundings are more beneficial. The earlier we return them to the home surroundings the better, unless the home surroundings are bad or we find that our orders are not carried out at home. In that case it is better to have the children in the hospital.

With reference to daily or every other day exercises, I think that if mothers carry out the exercises at home and the children are brought to the hospital every other day, it is sufficient. Then the muscles are not overtaxed and they get exercises every day. By showing the mothers once or twice, they can give the exercises very well.

OVARIAN ORGANOTHERAPY

A PRELIMINARY REPORT*

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It has been justly asserted that most of the work thus far done on ovarian organotherapy has been unscientific in character, and that the clinical results from its use which have been reported are therefore in large part untrustworthy.

The lack of greater progress in this important subject is due to certain impending factors which serve as a serious handicap to proper scientific investigation. Foremost among these factors is the vagueness of our knowledge of the physiologic processes of the pelvic organs. We do not know, for example, the cause of menstruation, or why menstrual blood does not coagulate. We have no definite knowledge of the relationship between menstruation and ovulation. We are fairly secure in our belief that the ovary is an organ of internal secretion, but it has not yet been proved conclusively in what part of the organ the secretion is manufactured. Moreover, we are quite at a loss to know whether the secretion of the ovary acts directly on the organism or whether it serves only as a balance to the products of more powerful glands in other parts of the body. In addition to our ignorance of pelvic physiology, of which the foregoing statements are only a few examples, we are greatly hindered in the study of ovarian extracts by the fact that it is impossible to make standard tests for most of the clinical reactions for which administration of the extract is chiefly indicated, animal experimentation being inadequate, on account of the exclusively human character of the reactions. The admirable experiments of Frank and others showing the effect of ovarian extracts on the uterine tissue of castrated animals are valuable in proving the actual existence of an active internal secretion in the ovary, but they do not lead us to definite information as to the effect of the ovarian secretion on such complicated human phenomena as menstruation and the vasomotor symptoms of ablation.

A serious handicap in the study of ovarian therapy is the fact that the nature of the secretion is not yet known. On account of this doubt as to the nature of the potent substance there has been no effective standardization in preparing the various extracts used clinically and experimentally.

As a result of our deficient knowledge of the physiology of the pelvic organs and the consequent limitation to more scientific methods of research, most of our information bearing on the subject of ovarian organotherapy has been derived from observations made in a somewhat haphazard way in connection with the clinical administration of the numerous commercial preparations put on the market by various drug firms. The statistics to be reported in this paper have been to a considerable extent taken from sources of this kind, and, as will later be pointed out, must be rigidly scrutinized in order to avoid drawing false conclusions, such as might possibly be deduced from an obviously inaccurate though by no means valueless method of research. However, after making due allowance for the inadequacy of the method, certain results have appeared in our work of such significance that this preliminary report seems justified.

Before enumerating our results in ovarian therapy it is necessary first to review briefly the present theoretical knowledge regarding the special sources of internal secretion contained in the ovary.

That the corpus luteum is an organ of internal secretion was first suggested by Gustav Born, who, after studying the corpus luteum verum of pregnancy, expressed the opinion that in histologic structure it corresponds to an internal secretory organ, and that it probably presides over the implantation and development of the fertilized egg in the uterus. Fraenkel supported the theory of Born by experimental work and attributed new physiologic functions to the corpus luteum; namely, the increase of the uterus at the time of puberty as well as its cyclical hyperemic changes of menstruation. Fraenkel concluded that the effect of the internal secretions of the corpus luteum is a preparation of the uterus for the insertion and development of the fertilized egg, menstruation taking place in case of failure of impregnation. Notwithstanding considerable opposition to many of Fraenkel's views, it is at present almost universally accepted that the corpus luteum is an organ of internal secretion, though the knowledge of its specific action is incomplete.

The designation of the corpus luteum as an "organ" of internal secretion is perhaps inaccurate, for it seems to set apart the corpus luteum from the rest of the ovary. It confuses the fact that the real organ of secretion is the ovary itself, of which the corpus luteum is only an integral part, containing as it does certain specifically developed cells from elements that are primarily scattered throughout the ovarian substance. That the corpus luteum is not the sole source, or even the most important source, of the internal secretion of the ovary is sufficiently evident from the fact that during the period of life of sexual immaturity in which the internal secretion is performing its most important function of body formation, the corpus luteum is wanting. It is necessary, therefore, to seek in some place in the ovary other than the corpus luteum for the primary source of the internal secretion.

There are found in the ovary certain connective tissue cellular elements, termed "interstitial cells," corresponding morphologically to the cells of Leydig, which are generally believed to constitute the source of the internal secretion in the testicle. These interstitial cells of the ovary occur in different form in different species of mammals. They correspond in histologic structure to the corpus luteum cells, being large and polyhedral in form, with granular protoplasm in which fatlike granules are embedded. The nucleus is relatively small, usually acentric, and is poor in chromatin. The cells have, like lutein cells, a yellow tint, and in this way resemble the interstitial cells of the testicle of many species. Just as in lutein cells and in the cells of Leydig, mitotic figures are not seen (Tandler and Gross).

The existence of the interstitial cells has long been recognized, having first been discovered by Pflüger in 1863, who demonstrated them in the ovaries of cats and dogs. Successive investigators found the cells in

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numerous species and finally in apes and in human beings. It was found that they occur with great inconstancy, in some species appearing in separate glandlike masses, in others as scattered cells. They also exhibit marked variations in the same species. Thus in the embryo of the horse, the interstitial cells are strongly developed, while toward the period of birth they become gradually less well defined (Born). In some species they increase at the time of sexual maturity and then diminish with age. In other animals they are most prominent during the spring of the year or during the season of rut. In still others they are affected by environmental changes, such as long continued isolation. More recent investigation has shown that the interstitial cells become more highly developed after roentgenization of the ovaries, while in the male the homologous cells of Leydig undergo a like development as a result of vasectomy. These observations have paved the way for valuable experiments which have added much to our knowledge of the nature and morphology of the interstitial cells.

Equally interesting have been the speculations regarding the origin of these cells. Schroen in 1863 regarded them as fragments of disintegrating corpora lutea. His and Waldeyer considered them wandering cells. Tourneaux recognized the homology between them and the cells of Leydig, and ascribed their origin to the preexisting connective tissue, a theory which we shall see harmonizes with views of the present time. Schulin described them as epithelial structures; Harz as offshoots of the glomeruli of the kidney; Chiarugi saw in them rests of the wolffian body.

Limon was the first to recognize their origin from the lutein cells of the theca interna of the atretic follicles. Limon's views have been adopted by the best investigators, and it is now generally accepted that *the interstitial cells of the ovary either are identical with the lutein cells of the atretic follicles or at least are derived from them* (Tandler and Gross). The inconstancy of the appearance of the interstitial cells is explained by the fact that in some species or under certain conditions during the process of follicle atresia the theca lutein cells become "disaggregated," that is to say, separated from the surrounding envelop of the follicle (theca externa) and deposited in glandlike masses, or scattered indiscriminately through the ovarian stroma. Thus, in the rabbit, disaggregation takes place and the theca lutein cells are found in glandlike masses to which the term "interstitial gland" has been given. In the human ovary, on the other hand, disaggregation takes place only rarely, and the theca lutein cells remain confined by the external envelop of the follicle. Hence an interstitial gland is not seen in the human ovary. It is quite conceivable that the function of the interstitial cells as producers of an internal secretion might be performed equally well whether limited by a theca externa or scattered in the stroma.

If we accept the theory of the identity of the interstitial cells and the follicle lutein cells, we must conclude that the production of the interstitial cells is in reality a function of follicle atresia.

If, now, it can be shown by animal experimentation and otherwise that the interstitial cells are producers of an internal secretion, then we must conclude that follicle atresia is not a pathologic but a physiologic process, the object of which is the elaboration of an internal secretion.

The proof of the internal secretory power of the interstitial cells cannot be included in the scope of this paper. We can only allude to the influence of the ovary on the growth of the individual before puberty as shown by early castration; to the experiments with roentgenization, showing the influence of the interstitial cells on secondary sexual characteristics; to the homology of the interstitial cells and the cells of Leydig, and to the effects of ovarian transplantation and ovarian therapy, in which the influence of the corpus luteum is excluded.

Thus we have sufficiently convincing evidence that the internal secretion of the ovary is manufactured both by the corpus luteum and by the atretic follicles. It is now necessary to point out the relationship between these two mechanisms from a physiologic standpoint. The exact nature of the lutein cells of the corpus luteum has been a matter of much discussion. Some have regarded them as epithelial in origin, others as derivative of connective tissue. According to Pfannenstiel, the lutein cells are partly epithelial and partly connective tissue in structure. By this theory the innermost layers of cells toward the center of the corpus luteum represent a luteal reaction of the granulosa cells which develop from the original epithelial lining of the graafian follicle; while the outer or theca layers represent a like reaction of proliferating cells springing from the connective tissue envelop, or theca interna. These last named elements of the corpus luteum were termed by Pfannenstiel "theca lutein" cells. They correspond in the matured corpus luteum to the lutein, or interstitial cells of the atretic follicle.

The function of the theca lutein cells is probably twofold. The presence of fat in the protoplasm and the rich network of blood vessels with which they are invested early suggested that they supply nutritive material for the development of the egg. The theory that they elaborate an internal secretion is of comparatively recent date. To them was first ascribed hypothetically a specific influence on the sexual impulse and the development of the secondary sexual characters, the latter theory being now well established by experimental proof.

Between the corpus luteum and the interstitial gland (i. e., disaggregated interstitial cells in glandlike mass) an interesting reciprocal relationship has been pointed out by Bouin and Ancel, who have divided animals into two groups according to their methods of ovulation. To the first group belong those species in which ovulation occurs spontaneously and periodically, as in the human race, the primates, the dog, the mare, the pig and the cow. To the second group belong those species in which ovulation occurs only after coitus, as in the rabbit, guinea-pig, mouse and cat. Representatives of the first group exhibit a periodic corpus luteum and a corpus luteum of pregnancy, but not a well-defined interstitial gland; while those of the second group have a corpus luteum of pregnancy, but in place of a periodic corpus luteum an interstitial gland (Tandler and Gross).

It has been objected that the interstitial cells, being of connective tissue origin, are not of the true endosecretory type, which is usually epithelial in character. This objection is met by the fact that certain other connective tissue elements are known to possess endosecretory power, notably the suprarenal cortex and the cells of Leydig. It has been demonstrated that the endosecretory elements exhibit characteristic staining properties, and among these elements has been included a list of cells of connective tissue origin, such

as the cells of the serosa, the stellate cells of the liver, the reticulum of the blood and lymph apparatus, and the bone marrow (Goldmann).

Another point of interest is the manner of growth of the interstitial cells. It is quite evident that they develop from the preexisting connective tissue cells of the ovarian stroma, which at a given moment "become activated" and take on the morphologic character and functional properties of interstitial cells (Tandler and Gross). It is conceivable, therefore, that the undifferentiated stroma cells of the ovary have endosecretory powers which may be of value in the manufacture of ovarian extracts for therapeutic purposes.

An important phase in the study of the ovarian internal secretion is the question of the selective action of certain of the secretory elements. This part of the subject is at present very much in the dark. Fraenkel's assertion that the corpus luteum regulates the nidation and early growth of the egg is by no means universally accepted. The early theory that the corpus luteum presides over menstruation is no longer tenable, some even holding that menstruation is determined by the elimination of the corpus luteum. Somewhat more definite is the evidence that the interstitial gland presides over the development of the secondary sex development, experiments having shown that the sex characters remain if the purely generative portions of the ovaries, after early castration, are excluded by the Roentgen ray, whereas these characters undergo wide variation after early castration (Tandler and Gross). There is much to show, on the other hand, that the action of the ovarian secretion is neither direct nor selective, but that it exerts only a balancing influence on other correlated and more powerful glands, the activity of which the ovarian secretion discharges or suppresses, as the case may be.

Our clinical observations in the study of ovarian therapy are confirmatory of this theory.

To sum up then, present knowledge indicates that there exist both in the corpus luteum and in the atretic follicles cellular elements identical in their origin from a specific connective tissue structure with the theca interna, and capable of producing an internal secretion which is important to the growth and normal functioning of the organism. If this is true, we have a basis on which to found a rationale for ovarian therapy.

If an internal secretion is manufactured from both the corpus luteum and the atretic follicles by cells of identical structure, extracts made from the corpus luteum alone lack that valuable part of the secretion which is derived from the atretic follicles. Moreover, it is impossible to tell by inspection whether a given corpus luteum is in the process of maturation or at the height of its development, or in a stage of involution and disintegration. It must happen that in the preparation of many corpora lutea for therapeutic purposes, a varying number are included in which the essential cells are no longer active as organs of internal secretion, and are actually in a condition of protein dissolution. We should expect, therefore, that commercial preparations of corpus luteum would present a wide variation in their therapeutic effects, and, owing to their readiness to decompose, would have a special tendency to become toxic.

On the other hand, if the preparation be made from the whole ovary, including corpus luteum, stroma, and follicles, the important follicular secretion is not lost. Preparations of this kind would be expected to be more stable in their composition and more constant in their effect than those of the corpus luteum alone. These conclusions have been amply borne out by our clinical experience.

In estimating the comparative merits of preparations of the whole ovary and those of the corpus luteum alone, most of our observations have been made in treating the vasomotor symptoms following hysterectomy. In this type of case the corpus luteum showed a great variation in effectiveness, often being entirely valueless, and occasionally producing digestive disturbances. On the other hand, the whole ovary, used in a large number of cases, showed great constancy in therapeutic effect, so that we have come to regard it as almost a specific in the treatment of ablation symptoms, both of the artificial and natural menopause. Striking results have also been obtained in the treatment of functional amenorrhea, and in the circulatory disturbances of the external genitals, such as kraurosis and the discomforts of senile atrophy.

In order to test further the effect of luteal preparations compared with those of the whole ovary, a series of clinical observations was undertaken with desiccated corpora lutea of pregnant animals. In all, nineteen cases were treated, representing hot flushes from the menopause, oligomenorrhea, dysmenorrhea and amenorrhea. In all but two of the cases, toxic symptoms of a digestive nature were produced. Preparations from both the cow and the pig reacted in the same way. The symptoms were invariably those of nausea and vomiting following one or two doses. In one case the ingestion of one 5 grain capsule resulted in continuous nausea and occasional vomiting for a period of ten days. The result of these clinical experiments cannot easily be explained. It was at first thought that the effects might be due to decomposition of the extract, but fresh preparations produced the same symptoms. They could hardly be due to anaphylaxis, on account of the high percentage of patients affected.

These observations suggest the possibility that the nausea and vomiting of pregnancy may be determined by the toxic effect of the internal secretion of the gestative corpus luteum.

In view of the favorable results obtained from the whole ovary compared with the corpus luteum alone, and of the positively bad results from the corpus luteum of pregnancy, we next determined to try the effect of the ovarian substance alone minus the corpus luteum.

In this experiment, the ovaries of pregnant animals were chosen partly as a check to the experiment with the gestative corpus luteum and partly to test the therapeutic effect of the internal secretion of the atretic follicles. It was thought that pregnant ovaries would be particularly favorable for studying the follicle internal secretion, owing to the well-known fact that during pregnancy the process of follicle atresia is especially active.

The results with this substance were interesting. The toxic effects created by the corpus luteum of pregnant animals was entirely absent, thus showing that its poisonous reaction could not have been anaphylactic in character. The new substance produced results similar to those of the nonpregnant ovary, but in general more striking. This was especially true in the treatment of vasomotor symptoms following hysterectomy. The preparation, as will be seen from later statistics, proved generally successful in the treatment of hot flushes,

and in certain cases of amenorrhea, dysmenorrhea, intermenstrual pain, catamenial nausea, headache and the genital discomforts of senile atrophy.

From observations made with this substance, incomplete as they are, we have at least suggestive evidence that an internal secretion is elaborated from the follicles which in therapeutic value is equal to and probably greater than that produced by the corpus luteum.

THERAPEUTIC EXPERIENCE

Ovarian therapy was extensively employed for a number of years in our hospital and private practice, before exact statistical records of the cases were instituted. Our experience during this period, though unrecorded, is, however, not without significance, for as a rule the reactions from ovarian therapy are sufficiently marked to make very definite impression. It was during this period that we observed repeatedly the therapeutic superiority of the whole ovary over the corpus luteum. Many commercial preparations of each type were tried, and a great variation in therapeutic effect was discovered. Of the preparations of whole ovary, a desiccated product put up by Armour & Co., administered in 5 grain capsules, proved the most efficacious. For the best results, it was found necessary to have fresh preparations and to impress on the patient the importance of keeping the capsules in a cool place to prevent decomposition. The corpus luteum products, though generally inferior to those of the whole ovary, were nevertheless not without therapeutic value.

Since the institution of careful records of therapeutic results, fifty-three cases have been observed in which the whole ovary has been employed. The following conditions were treated: vasomotor disturbances of the natural and artificial menopause, general debility, furunculosis of the external genitals, external genital discomfort from senile atrophy, amenorrhea, dysmenorrhea, oligomenorrhea, irregular menses, menstrual headache, nausea and vomiting, and sterility. Full statistical results of these cases will be given in a later report. It may be said that the most striking results were obtained in the treatment of menopause symptoms, and the circulatory disturbances of the external genitals. In all the conditions enumerated above, excepting sterility and essential dysmenorrhea, the preparation proved therapeutically valuable, though in each of the conditions it often failed to be effective.

Since the employment of the ovaries of pregnancy without the corpus luteum, all the cases have been carefully recorded. Reports of thirty-four of these cases have been collected, of which a complete report will be made at a later date. The conditions for which the substance was administered were the same as those mentioned above, for which the whole ovary was used. The results were in general similar to those from the whole ovary, excepting that they were somewhat more constant and in many instances more brilliant. In several cases a comparison was made with the effects of the whole ovary. In all of these cases, with one exception, the ovary of pregnancy without corpus luteum had the advantage. In three of these cases in which the whole ovary had completely failed, the ovary or pregnancy produced surprising results.[1]

CONCLUSIONS

1. Studies in ovarian organotherapy are at present necessarily confined for the most part to clinical observations. Such observations, though admittedly inaccurate, may, to a limited extent, be of scientific and practical value.

2. Personal clinical experience with preparations of ovarian substance has revealed that preparations of the corpus luteum alone are less efficacious therapeutically than are those of the whole ovary.

3. Theoretical knowledge and scientific experimentation tend to show that an important part of the ovarian internal secretion is elaborated by the interstitial cells.

4. It is probable that the interstitial cells correspond to the lutein cells of the theca interna of the atretic follicle. In some animals these cells become disaggregated and appear as glandlike masses (interstitial gland); in others they remain confined to the follicle by the outside envelop (theca externa).

5. The interstitial cells, therefore, correspond to the theca lutein cells of the corpus luteum.

6. The interstitial cells of the ovary are analogous to the testicular interstitial cells of Leydig, which are known to elaborate an internal secretion.

7. Ovarian therapy, for its best effectiveness, should include at least the product of the interstitial cells. Preparations should, therefore, comprise the ovarian stroma, in order to take advantage of the atretic follicles.

8. Preparations made from the corpora lutea of pregnancy proved too toxic for practical use.

9. Preparations made from the ovaries of pregnant animals, with exclusion of the corpora lutea, proved superior therapeutically to preparations of whole ovaries of nonpregnant animals that included the corpus luteum.

10. The superiority of the follicular products of pregnancy is explained by the fact that during pregnancy, follicle atresia is especially marked, and is accompanied by a corresponding increase in the activity of the interstitial cells.

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ABSTRACT OF DISCUSSION

DR. S. W. BANDLER, New York: A year ago I had the pleasure of discussing a paper by Dr. Graves on this subject. We agreed then that better results were obtained from ovarian extract than from the extract of corpus luteum. One needs only to see the ovary under the microscope to realize that there must be two distinct secretions in the ovary. The experiments of Schafer have shown that if corpus luteum is injected into animals, contraction of muscle fibers results. Injection of extract of the hilus causes no contractions of the uterine muscle fibers. Therefore, we must conclude that there are at least two hormones in the ovary; one which contracts muscle fiber and one which does not.

On what depends the difference in structure and form of the body in the female and the male? We must remember that the ovary acts for many years before the girl menstruates. During these years before menstruation no ova are given out. Yet we see the difference physically between a boy and a girl of the same age. We have interstitial cells in the testis, we have interstitial cells in the ovary, and they act differently on the different areas of the pituitary gland. We have the interstitial cells of the testis stimulating the anterior lobe more than is done by the ovary in the female. Hence the anterior lobe of the hypophysis is much more of a male gland than a female gland. We have the aid of the ovary in stimulating the posterior lobe more than does the testis in the male. Hence the posterior lobe of the pituitary gland is more a female gland than a male gland.

The growing fecundated ovum with its trophoblast and later chorion is a parasite attempting to invade the maternal uterine structures. The protective power of the maternal

1. I am indebted to Parke Davis & Co. for their courtesy in furnishing me with material with which to carry out these clinical experiments.

structures prevents too great an invasion, and among these protective, ductless gland forces the pituitary and the corpus luteum must be reckoned. Hence we see that the ovary, as well as the other ductless glands, presents numerous hormones.

Twenty years hence we shall be treating various pathologic states and conditions by the administration of tested, isolated hormones instead of giving, as we are compelled to do at present, the whole gland extract.

DR. EMIL NOVAK, Baltimore: Dr. Graves has approached the problem from the proper point of view, but I know he will agree that it is still far from being solved. Of the elements making up the ovary, the one most clearly associated with the menstruation is the corpus luteum. This structure, in one phase or another, is always to be found in the ovaries of menstruating women, exhibiting cyclical changes corresponding to the stages of the menstrual cycle. On the other hand, corpora lutea are not found in the ovaries of young girls before puberty or in those of women beyond the menopause. Furthermore, administration of corpus luteum extracts at times induces menstruation in amenorrheic women. For such reasons as this, I have personally been inclined to the employment of corpus luteum preparations in the treatment of menstrual disorders. The results cannot be said to be brilliant, but they are often satisfactory, especially in the psychoneuroses of the menopause.

Aside from menstruation, the ovary is important also in the determination of the developmental changes characterizing puberty — such changes as the configuration of the body, the distribution of the hair, the character of the voice, etc. The evidence indicates that the hormone concerned in these secondary sex changes is derived from some element in the ovary other than the corpus luteum. What this element is we cannot say, and hence in the treatment of such developmental conditions as retarded puberty, it has seemed to me that extracts made from the entire ovary are indicated rather than those derived from the corpus luteum alone.

As for the interstitial cell, I do not believe that Dr. Graves has made out a case for it, as far as a rôle in menstruation is concerned. These cells, so characteristic of the ovaries of such animals as the rabbit and guinea-pig, are not found in the human ovary. It is true that in pregnancy the theca cells of atretic follicles multiply and form what is called the interstitial gland. In this sense the interstitial cell of the human female is important in pregnancy, but I know of no evidence showing that it influences menstruation. During the early part of pregnancy a corpus luteum is present, but menstruation is absent. This apparent paradox is easily explained on the assumption that the corpus luteum hormone is inhibited or counteracted by a hormone of fetal (trophoblastic) origin.

From a practical standpoint, the gynecologist or general practitioner may limit himself to three extracts in the treatment of menstrual disorders: (1) ovary or corpus luteum; (2) pituitary; (3) thyroid. Of these three, I believe the one which is most valuable in the largest number of cases is the extract of thyroid.

DR. LAWRENCE W. STRONG, New York: I wish to accentuate the difficulties of drawing conclusions, which Dr. Graves pointed out. Indeed, I wish to deprecate the drawing of any conclusions from the exhibition of the commercial preparations of the corpus luteum, at least, until further experimental work is done. Much has been said about the interstitial glands. It is unfortunate that we have no exact knowledge of these glands. According to a recent hypothesis of Shroeder the follicle has a definite function — stimulation of the growth of the uterine mucosa—while the corpus luteum has quite a different function — stimulation of secretion of the uterine mucosa. If this is the case, and possibly it is, there might be antagonism between the secretion of the theca cell and that of the true corpus luteum. For that reason, in experimental work, instead of using the entire gland, we should use the pure secretions from definite organs. It seems to me necessary to get exact information in regard to the secretion of the corpus luteum itself. There is not a unanimity of opinion at present on this. Perhaps the best opinion held is that it inhibits menstruation rather than causes it. That being so, we are certainly in doubt as to the actual cause of menstruation; it is therefore perfectly obvious that one cannot use the commercial preparation in an intelligent way.

DR. P. B. SALATICH, New Orleans: From our observations we are sometimes forced to feel that the internal secretion of the ovary has something to do with holding the weight down. In one patient operated on for pelvic conditions, the woman weighed 98 pounds, eight years ago. The right ovary was removed and most of the ovary on the left had been taken out. When I operated again five weeks prior to this meeting she weighed 240 pounds, having steadily gained weight, and had had very little menstruation at each period. I found that the part of ovary left was doing very little work. It was bound down by adhesions and it was necessary to remove it. An interesting point in this case is that about three weeks afterward, at about the time she should have menstruated again, she had severe headache. I treated her with all kinds of remedies, even morphin. I put her on ovarian extract and in twenty-four hours the headache had disappeared. We find many patients who gain weight rapidly, and these patients we know do not menstruate. It is important in all gynecologic cases to try and save a part of both ovaries. If this cannot be done in situ, I save a part of the ovary and put it between the fascia and the muscle. I had one such case and after two or three months the woman began to menstruate. I have had more than one case of high blood pressure coming on after the menopause, and in trying to locate some probable cause for this from a physiologic standpoint, I put these women on ovarian extract. To my surprise the blood pressure lowered.

DR. ADAM P. LEIGHTON, JR., Portland, Me.: For the past five or six years I have used quite extensively the extract of corpus luteum in the treatment of those gynecologic conditions dependent on ovarian deficiency. I have used ovarian extract as well as corpus luteum, but it is with the latter that I have obtained my good results. The only reason that good results have not been forthcoming in some cases in which corpus luteum has been indicated is that we have not given it in sufficient quantity or for a sufficient length of time. One must administer it for six or eight weeks, as a rule, before the desired results may be expected or otbained in any given case of ovarian insufficiency. The action of corpus luteum by mouth is slow and cumulative, and we should impress this fact on the patient at the time when treatment is commenced.

DR. WILLIAM P. GRAVES, Boston: The contradictions which exist in regard to this important subject are illustrated by the remarks of Drs. Novak and Strong. Dr. Novak said that menstruation is dependent on the corpus luteum, while Dr. Strong expressed the opinion that the corpus luteum actually inhibits menstruation. The latter view is one which I have come personally to believe. It is supported to a certain extent by a clinical experiment which I recently made.

Two amenorrheic women came to the hospital at the same time. One of them, 26 years of age, had menstruated only a few times in her life. She had been married five years, without children. She was perfectly developed, both as to her primary and secondary sexual characters. The second was a young woman of 21 who had menstruated only two or three times in her life, the last time four months previous to her coming to the hospital. It happened that there was at the hospital at the same time a woman who had had menorrhagia and metrorrhagia for five years as a result of uterine insufficiency. Repeated curettings had been of no benefit. The uterus was anatomically normal. The Wassermann test was negative. Inasmuch as a hysterectomy seemed advisable, it was determined to graft ovarian tissue from the menorrheic woman into the two amenorrheic patients. Accordingly, during the hysterectomy on the last named patient, sections were taken from the ovary in which there was no corpus luteum. These sections were immediately transplanted into the anterior cervical lip of the amenorrheic patients. The first patient a few days after the operation

had a perfectly normal menstruation for the first time in three years. The second patient menstruated normally in about twelve days and has menstruated regularly since for about five months.

In these two cases the action of the ovarian internal secretion was apparently exerted by a portion of ovarian tissue from which the influence of the corpus luteum was excluded.

SUDDEN AND PROFOUND DEAFNESS: ITS SIGNIFICANCE *

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A more exact distinction might and should be made between acute deafness, that is, actual loss of all practical hearing in one or both ears, and impaired hearing or so-called deafness. The type of deafness I have in mind to discuss is one that is profound and at the same time appears suddenly. To draw an absolutely arbitrary line of distinction between this and all other types of deafness is manifestly impossible, but it is practicable to separate them into two groups for the purpose of aiding in the diagnosis and of rendering immediate first aid in order to avoid irreparable damage. Hearing many times is relative as far as it is a symptom, but when a person with normal or satisfactory hearing rapidly loses all of the hearing in one or both ears, his condition assumes a significance distinctly in a class of its own. Therefore, under the grant of this title, consideration will not be given to such types of deafness that present slight or only partial impairment of hearing, although possibly taking place suddenly, or to such cases in which profound or absolute deafness ensues gradually from chronic changes in or about the hearing apparatus. In the latter class of cases the same importance is not attached to the deafness as where such a calamity occurs apparently out of a clear sky. The patient at the end of a day's hard work, or after some active exercise, suddenly finds his hearing gone on convalescing from a protracted illness, but with ordinary good ears, he suddenly loses his hearing, or while going about his daily routine, or on awakening after a night's rest, there is a total extinction of his hearing powers. And then again in the presence of a suppurative ear disease his hearing may suddenly be lost. Such a condition most reasonably creates a state of alarm, if not panic.

The symptomatology in a patient stricken with sudden and profound deafness is often that of Ménière's syndrome: that is, sudden deafness with tinnitus and vertigo, occasionally nausea and vomiting, and at times loss of consciousness. But the pathogenesis, as well as the location of the lesion, determines the presence or absence of these and other symptoms that may be present, such as nystagmus, facial paralysis, ataxia, headache, aphasia, convulsions, hemiplegia, mental bewilderment, and in case of a petrous fracture, a serosanguineous discharge from the ear and nose. The tests show obliterated perception of all ordinary sounds. Sometimes there may be gaps in the hearing scale where some slight perception still lingers, but oftentimes the supposed remnants of hearing are only perceptions of other sensations like those of touch, temperature, vibration and vision.

Consideration of the fact that malingering and hysteria may contribute to the exhibition of these symptoms should at all times be in mind, but ordinarily such causation may be dismissed. In traumatism the causative factor is so apparent that only occasionally will the diagnosis be obscured. The same may be said of the occupational causes, an example of which is the caisson worker. A few cases may be caused by various toxicities, either drug or disease, although ordinarily such exciting factors bring about a more gradual loss of hearing. Following the use of salvarsan or its allies, complete paralysis of the eighth nerve has been reported at various times. It is still debatable whether or not the paralysis occurs as a result of a Jarisch-Herxheimer reaction. In a similar way anaphylactic cases may occur following the use of certain serums. The greater number of cases are caused by certain systemic diseases like syphilis, the various anemias and leukemias, diabetes, arteriosclerosis, mumps, pertussis, and, as mentioned before, in some of the suppurative ear diseases. Also among the insane this type of deafness occurs.

The site of the lesion directly causing the symptoms of deafness may be in the labyrinth, in the eighth nerve or in the cranial cavity, the labyrinth cases being perhaps the more numerous. The causative factor may operate directly on these centers or indirectly through neighboring channels. Both the vestibular and auditory functions may be involved simultaneously or separately. Ordinarily disorders of the conduction apparatus rarely cause sudden and absolute deafness. The following case, therefore, is unique in my experience and of unusual interest:

CASE 1.—A woman, aged 28, while still in bed, during convalescence from pernicious anemia, there being no previous history of hearing impairment, was suddenly seized with a buzzing sound in the head. There was a feeling of tension and fulness in the ears accompanied by some pain. Complete deafness resulted, accompanied by nausea and blood stained sputum. Inspection showed that the drums were bulging and blue gray. Incision was followed by free bleeding and bloody serum. The hearing gradually returned to almost normal.

Similar cases of bleeding in the middle ear have been reported from other causes, such as gun fire, especially from the big field pieces now in use, and also from head injuries due to blows or falls.

Hemorrhagic effusions into the labyrinth will bring about sudden and complete loss of hearing. In injuries due to a fall or blow, the hemorrhage frequently becomes manifest, but occasionally it is concealed, thus obscuring the direct cause of the deafness. In the apoplectiform variety of hemorrhages, such as occur in hematopoietic disorders like pernicious anemia, leukemia and chlorosis, the deafness is usually sudden and profound. In the labyrinth cases that are due to congestion or anemia, the deafness and tinnitus may be only temporary, while the hemorrhagic cases and those due to emboli are far more serious and profound. The embolism or hemorrhagic variety is illustrated in Case 2:

CASE 2.—A man, aged 50, an accountant, while at work at his desk, had a severe ringing tinnitus in both ears followed immediately by loss of equilibrium causing him to fall from his chair. There was no loss of consciousness and no muscular spasm or paralysis. His mind remained clear. There was some nausea, and profound deafness appeared immediately. There was no previous ear disease, suppurative or otherwise, and no previous attacks of vertigo.

A week later there was no response of either the vestibular or hearing labyrinth. His deafness remained permanent.

* Read before the Section on Laryngology, Otology and Rhinology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

In syphilis and suppurative ear cases there is more often a history of various degrees of vertigo and perhaps tinnitus before the grand attack.

In the labyrinth cases complicating either acute or chronic middle ear suppurations, there may result sudden and complete deafness either alone or associated with vestibular disturbance; but more usually this deafness is not sudden or completely lost at once, unless from rough or unnecessary manipulation during operation or treatment. In the serous type of labyrinthitis the hearing usually returns on convalescence or recovery. I have seen several such cases.

Of the constitutional causes the syphilitic cases are probably the most numerous. In these cases the lesion may be due to the toxins or to a gumma. In some cases it may be due to a destructive process and an endarteritis or an acute inflammatory process. The site of the lesion may be in the labyrinth, in the nerve or in the brain centers, and it may occur in either the acquired or the hereditary cases. In the acquired form a neuritis from the toxins may occur as early as the primary period of the disease, although more commonly the changes show later during the secondary and tertiary stages, which may be years after the primary and after a presumable cure. The following case illustrates this type:

CASE 3.—A man, aged 62, experienced a sudden and absolute loss of hearing in both ears following a "cold" in the head the week before. He had had some slight impairment of hearing of late years which presumably was of a middle ear catarrhal type. At the time of losing his hearing suddenly he was still in bed suffering from his "cold." The attending physician said it was due to the "cold" and would pass off in a day or so. The deafness was accompanied by a severe tinnitus and vertigo, the latter occurring both while standing and lying. There was some nausea but no vomiting. The patient recovered from his "cold," but the deafness continued; the vertigo lessened but was not entirely absent; tinnitus was very annoying. When first seen by me, while he was still in bed, due to the vertigo, examination of the ears with tuning forks and whistle elicited no response. Inflation of the eustachian tubes did not improve the hearing. Inquiry at this time brought out the fact the patient had acquired his syphilis forty-five years before. He was under treatment at that time for three or four years and considered himself cured, having had no evidences of the disease since that time, meanwhile having married and raised a healthy family. The Wassermann test was strongly positive. He was immediately placed on vigorous treatment, starting with mercury and iodids in solution and then sodium cacodylate in increasing doses. Improvement seemed rapid after this. Later he was given five injections of neosalvarsan in doses of 0.9 gm. Repeated Wassermann tests since that time, which was fifteen months ago, have been negative. His hearing has improved so that it is better than before his recent illness.

It will be noted that in this case the attending physician attributed the deafness to the "cold" and made a prognosis of speedy recovery within a few days, and that he did not recognize the syphilis as a causative agent. Fortunately the true condition was recognized early enough, and by the institution of vigorous and proper treatment at once, recovery was possible. If cases of this kind pass unrecognized for any length of time no such brilliant results can be expected.

Another case of probable endocranial syphilis exhibited, in addition to an abolition of auditory perception, distinct diabetic symptoms.

CASE 4.—A man aged 41, returning from a fatiguing ride and exposed to inclement weather, suddenly and absolutely lost all hearing in both ears. There was no vertigo, nausea, vomiting or tinnitus. The right ear previously was apparently normal, the left ear was somewhat impaired as to hearing and had a mild tinnitus, but no paracusis willisiana. Following this attack he was under the care of several physicians and one aurist. No one diagnosed syphilis, or treated him for it. Four months later he presented himself to me for examination. The patient was apparently well and robust and absolutely denied syphilis. Tests with voice, tuning forks, whistle, bells, etc., elicited no response. In speaking the patient fairly shouted. Both drums were fairly normal and the tubes were open. There was no spontaneous nystagmus, but it was easily induced calorically but not exaggerated. Turning evoked a normal and strong horizontal nystagmus. There was no Romberg except after testing. There was no hereditary deafness. Two Wassermann tests of the blood were strongly positive. The spinal fluid showed a lymphocytosis and serum globulin in excess; Fehling and Wassermann tests were both positive. The patient was placed in the hospital for treatment with potassium iodid, and mercury was administered in large doses. Two weeks later 0.6 gm. of salvarsan was given intramuscularly. This was repeated in four weeks. In the interval, mercury and iodids were used. The urine was examined before and after treatment commenced, and was negative. Shortly following the first, as well as after the second injection, he spoke of a great desire for drinking water. About seven weeks after commencing treatment he began to experience symptoms of myasthenia. General muscular weakness and easy fatigue on slight exertion appeared. He was constipated and lost his appetite. Later, there were attacks of cardiac oppression and polyuria, and a large quantity of sugar appeared in the urine. Within two weeks, more difficult mastication and deglutition developed, with attacks of vomiting, extreme exhaustion and finally coma, in which the patient died. No necropsy was held. No improvement in hearing followed the treatment.

In these cases there may be hemorrhagic areas. The labyrinth and its nerve may show round cell infiltration and beginning atrophy in the spiral ganglion, lamina spiralis and the nerve. The inherited cases may occur at any age; often in the babe, deafmutism results. Again, it may occur just before puberty, when it is recognized as one of a triad of symptoms, namely, interstitial keratitis, notched incisor teeth and deafness. The disease may originate endocranially as a meningitis or an endarteritis, and then extends along the nerve and vessels to the labyrinth.

In Case 4, the lesion, prior to the grand attack, and when the patient was having some impaired hearing and tinnitus in the one ear, appears to have been an endarteritis of the cochlear artery. This might then have culminated in the apoplectiform attack, resulting in the sudden and total extinction of all hearing and tinnitus. That the cochlear nerves alone were involved is shown by the absence of all vestibular disturbance. But from the subsequent course of the case presenting diabetic symptoms and medulla disturbance, it is reasonable to infer that the site of the lesion was near the floor of the fourth ventricle. Fibers of the cochlear nerve decussate in this region, passing across to the trapezium and upper olive, and a lesion in this neighborhood might not only destroy the function of the cochlear nerves but also irritate sugar production, etc.

In many of the acute diseases, like influenza, mumps and pneumonia, without an acute inflammatory or a suppurative ear process being present, the pathology recently has been attributed to changes within the labyrinth the result of toxic agents. The toxins may cause a serous effusion or a true neuritis, while in the other cases actual destruction to the end organs may result, particularly the organ of Corti.

A meningic deafness that may accompany cerebrospinal meningitis is usually sudden and profound, and

is due to a diffuse labyrinthitis. Its appearance at the time may be overlooked, owing to the crisis present of the fever itself. The drum and middle ear are almost always normal or nearly so, differing in this from panotitis seen in scarlet fever and measles. All of these cases assume an importance much beyond the average case of deafness and much beyond what many physicians appear to recognize. With a fuller knowledge of their seriousness, many of these patients might be rescued from a probable hopeless and helpless future. By instituting prompt and vigorous measures in treatment, some of them can be cured or at least greatly benefited. Auditory reeducation will benefit a certain number. Where such gratifying results are impossible, the prompt employment of lip-reading as a new education should be advised.

30 North Michigan Avenue.

ABSTRACT OF DISCUSSION

Dr. Henry S. Wieder, Philadelphia: Dr. Stein calls attention to the necessity for early treatment, especially of syphilitic deafness, if one hopes to obtain results. I have been fortunate enough to have something to do with one case, a man who was almost totally deaf for five years. One had to shout through a megaphone to make him hear. He showed no nystagmus, and no definite evidence of vestibular trouble. We put him in the Bárány chair and from our vestibular tests suspected syphilis. We had a Wassermann test made which showed a four plus. Following salvarsan treatment he had two intraspinal injections of Dr. Schamberg's new antiseptic, mercurophen, and now he can hear an ordinary voice tone. He shows peculiar manifestations in that when he turns his head to one side he can hear more plainly than when he holds his head erect. Syphilitic cases should not be given up no matter how long they have gone on, and in all cases of profound deafness, the patients should be subjected to the Bárány test, whether they show definite evidence of vestibular trouble or not, because we are finding in many cases that latent syphilis will show itself earlier in the eighth nerve than in any other nerve in the body.

I have recently seen two cases of cerebrospinal meningitis, one in a young child who is absolutely stone deaf and shows no cochlear or vestibular reaction. I also have a child that came recently with a ready-made diagnosis of having had cerebrospinal meningitis at 6 months of age. This child's hearing is very good, but on turning as fast as we can, no vestibular reaction can be obtained. I cannot quite conceive of the inflammation completely destroying the vestibular portion of the nerve on both sides and leaving the cochlear portion alone. The case is still under observation.

Dr. T. O. Edgar, Dixon, Ill.: In illustration of the ear manifestations that may occur in leukemia, I wish to report the following case: A farmer, aged 44, referred to me for ear examination, presented the typical blood and other findings of myelogenous leukemia, probably of several years' duration. At 7 a. m., ten days before his death, the patient failed to answer even the loudest voice of his nurse, whereas three hours previously his hearing appeared to be entirely normal. The patient was conscious and able to respond readily when made to understand by writing, or otherwise. Otoscopically, the membrana tympani appeared quite normal. With the noise apparatus of Bárány in his left ear, he was able merely to detect a noise when one yelled in his right ear, and he was able to hear for a few seconds the loudest vibration of the small Stenger "A" fork. The vibrations of all the other forks of the Bezold series were unperceived. The left ear was completely deaf to the loudest voice and to the tuning fork mentioned. There was no pathologic, spontaneous nystagmus; the patient had, however, for the previous ten days been a little dizzy, but, so far as could be learned, did not exhibit a tendency to fall in any particular direction. Unfortunately, a postmortem was refused. The histologic findings, according to Schwabach and Alexander, are as follows: In the middle ear, free extravasation of red and white blood cells, infiltration of the mucous membrane with lymphocytes or effusion of blood, and accumulation of lymphocytes in the blood vessels; in the labyrinth were found (1) marked infiltration of the nerve stem and its branches and of the membranous parts with lymphocytes, with or without simultaneous effusion of red blood corpuscles, leading to rupture or compression of the soft part; (2) inflammatory reactions with leukemic infiltration of the soft parts; and (3) secondary changes, such as formation of connective tissue, bone and pigment deposit, and secondary degeneration of the nerve.

Dr. Cullen F. Welty, San Francisco: A neuritis of syphilitic origin is amenable to treatment, but the neuritis that comes from other sources, say a neuritis produced by scarlet fever, etc., is not. Such patients do not improve. A young lady about 20 years of age while consulting an ophthalmologist for a syphilitic cornea, from which she was almost blind, suddenly one morning became deaf. She could not hear a shout with a tube put in her ear. I did not wait for a Wassermann reaction. She was given salvarsan, which was continued for a month and her hearing was restored. That was about three years prior to this meeting.

One-sided deafness, I believe, is somewhat different from deafness on both sides. If we have a one-sided deafness, I am somewhat inclined to lay it to a syphilitic origin rather than to toxemia or neuritis. The toxemia or neuritis seems to affect both sides equally. It is a fact that the vestibular side is more amenable to treatment than the cochlear side. In a number of patients who complain of some dizziness and possibly nystagmus at times, on testing them with the rotary chair there will be a reaction, but at the same time, their hearing remains about the same.

Dr. Otto J. Stein, Chicago: The remarks of Dr. Wieder were interesting to me because he believes that old syphilitic cases that have been overlooked and neglected, and in which the patients have lost their hearing entirely, can be improved so that they may hear well. That is news to me. I do not think that is a common observation, but I can understand how this may be brought about by the intensive way of treating syphilis, especially by the intraspinal method of reaching the central nervous system.

It would detract from the important point of the paper if emphasis were not placed on the *early* recognition of these cases. So I think we ought to emphasize the importance of getting at them early and recognizing them and treating them energetically as soon as possible.

That the vestibular branch of the eighth nerve is so sensitive to the destructive influence of syphilitic disease has not been my observation. I have felt that it was the cochlear fibers that were more sensitive, and my cases usually have shown this to be so after employing all the tests that are recognized today for determining any present vestibular irritation.

The question is interesting and has been talked about a great deal, as to why in some cases there is a ready response to salvarsan, or any of its allies, and in others there is a deafness which does not respond to increasing doses. We recognize that many of these cases are due to the Herxheimer reaction and will respond to increased doses of mercury, but occasionally we have cases that do not respond to this treatment, and what the true pathology is I do not know. These cases make one hesitate about using great quantities of the remedy.

Poetic Hygiene.—

If thou to health and vigor wouldst attain,
Shun weighty cares—all anger deem profane,
From heavy suppers and much wine abstain.
Nor trivial count it, after pompous fare,
To rise from table and to take the air.
Shun idle, noonday slumber, nor delay
The urgent calls of Nature to obey.
—From the Code of Health of the School of Salerno;
Albert H. Buck, The Growth of Medicine.

THE FOUNDATIONS OF VOICE IMPAIRMENT RESULTING FROM TONSILLECTOMY *

ELMER L. KENYON, M.D.
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The following study is based on a careful investigation of the physiology of the soft palate and of the mechanicophysiologic importance of the tonsil, on a careful examination of 161 tonsillectomized throats, and on a study of thirty cases of voice or other disturbance resulting from tonsillectomy. The work has demonstrated the great need for accurate knowledge concerning the mechanical effects of tonsillectomy, and also has failed to quiet any feeling of unrest with respect to the effect of the operation on either the speaking or the singing voice. The study tends to prove that by reason of the important physiologic function of the capsule of the tonsil, the operation of tonsillectomy possesses a mechanicophysiologic importance much greater than that heretofore realized.

PHYSIOLOGY OF THE SOFT PALATE

Anatomically and physiologically, the faucial region is too complicated for easy or superficial interpretation. Certain anatomicophysiologic facts require emphasis:

1. The posterior pillars, namely, the palatopharyngei muscles with their overlying mucous membranes, cannot be considered as mere adjuncts of the soft palate, but must be regarded as actual intrinsic factors of the palatal structure. Their function consists in a musculo-anatomic service in connection with the body of the soft palate. When the levator muscles elevate the body of the velum on phonation, the palatopharyngei muscles cooperate with the levator muscles of the palate closely, to adjust the posterior pillars in the lateral angles of the posterior pharynx, thus closing off the nasopharyngeal isthmus laterally, a service accomplished by the body of the soft palate in the center.

2. The closure of the nasopharyngeal isthmus laterally, however, is not always accomplished wholly by the posterior pillar folds of the palate. In an unknown proportionate number of throats this lateral closure is accomplished by a cooperative action of the posterior pillars and the constrictor muscles which close in at the sides for this purpose. In view of the frequent impairment and destruction of the posterior pillars in tonsillectomy, this lateral action of the constrictors is highly significant.

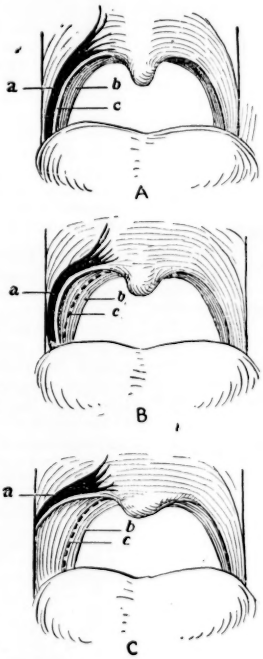

Fig. 1. *A*, schematic picture of normal anterior pillar: (*a*) palatoglossus muscle; (*b*) posterior pillar; (*c*) edge of anterior pillar; *B*, anterior pillar has sagged toward outer wall following operation; pulling action on soft palate has begun; *a*, palatoglossus; *b*, posterior pillar; *c*, normal position of edge of soft palate; *C*, marked retraction of anterior pillar, with half of the structure obliterated; tension on palate now is greater; complete obliteration of the anterior pillar (a still more marked deformity than that shown in C) occurred in 39 per cent. of the cases examined.

3. The palatoglossus muscle serves two purposes: first, in cooperation with the palatal elevators, to maintain a proper tension of the palate at any position of elevation, and, second, to lower the palate quickly as required in speech. Fortunately when this muscle is injured in tonsillectomy, as it almost always is, the natural rest position of the palate, with the increased tension of the palatoglossus under the new conditions, both serve quite well to take the place in the speaking voice of the action of the palatoglossus.

4. The soft palate varies considerably in length in respect to the distance to the posterior wall necessary to be covered on phonation. Occasionally the soft palate is developed so short as to prevent it from fully reaching the posterior wall, in which case the person talks with an open nasal voice. Since tonsillectomy often both shortens and stiffens the soft palate, the natural length of this structure may determine whether the voice of a particular tonsillectomized individual shall or shall not be permanently nasalized.

5. All the faucial structures are not only nicely adjusted for the complex and often violent movements of this region, but the tissues are capable of a very considerable extension and of stretching to accomplish the distances to be covered. This fortunate situation repeatedly serves to save the voices of tonsillectomized patients.

PHYSICOMECHANICAL FUNCTION OF THE TONSIL

The mechanical significance of the tonsil (including the capsule) consists in its carefully planned work with reference to the placement and movement of the faucial muscles. To look on the function of the faucial tonsil, including its capsule, as mainly a physiologicochemical function and to pass by its probably much more important physicomechanical function is to ignore such facts as the following:

1. The firm capsule of the tonsil is most intimately and intelligently adjusted to the needs for placement and separation and mutual adjustment of the complex musculature of the region.

2. The extent of surface covered by the capsule is essentially uniform regardless of the amount of lymphatic deposit.

3. The weight of the capsule (as determined by careful studies) is a very considerable proportion of the entire tonsil structure, being with small tonsils at times even more than half the total.

4. Neither the pharyngeal nor the lingual tonsils possess this elaborate capsule.

5. The tonsil and its capsule form a necessary factor in the formation of a canal-like structure on which the direction, length, manner of action and

* Read before the Section on Laryngology, Otology and Rhinology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

protection of the palatoglossus positively depend.[1] Removal of the tonsil extracapsularly leaves the fate of the palatoglossus to the merest chance.

6. The tonsil and capsule not only act as an important protective covering and brace to the thin delicate curtain constituting the palatopharyngeus muscle, but also serve to help fix and maintain the relations of this muscle to the lateral wall.

7. The determination of the relationship between superior constrictor, the palatoglossus and the palatopharyngeus muscles and to the adjacent tongue and to the soft palate, is dependent chiefly on the tonsillar capsule. For example, the capsule serves by its close insinuation into the acute angle made by the emergence of the palatoglossus and palatopharyngeus muscles from the palate to prevent mutual interference and injury and adhesion between these muscles.

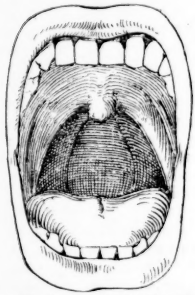

Fig. 2.—How the posterior pillars in some throats hug the posterior wall on phonation, thus closing off the nasopharyngeal opening laterally.

8. Proof of the value of the capsule as a support to the faucial muscles lies in the complete preservation of the anatomic relations following intracapsular operation, as compared with the distortions following extracapsular operation.

The part played by the lymphatic tissue in this function is that of increasing the rigidity of the capsular support, and of serving as a protective cushion. While the exactitude of certain of these relationships is subject to slight physiologic variation, the facts as stated remain essentially constant.

THE INTRAPHARYNGEAL APONEUROSIS AND THE CAPSULE

Undoubtedly the tonsillar capsule serves the very purpose it would have to serve if it were in fact identical with the intrapharyngeal aponeurosis. The question of exact identity of structure is unimportant, but the question as to whether or not it is possible to separate from the capsule, in performing the operation of tonsillectomy, connective tissues capable of serving fairly well the placement and protective purposes of the muscular fascia in this region is highly important. Paterson[2] declares that the deep connective tissue of the tonsil becomes so closely adherent to the intrapharyngeal fascia that separation is impossible, and "any operation for complete removal of the tonsil must not only go outside the intrapharyngeal fascia, but sometimes take the peripharyngeal aponeurosis as well." Des Camps[3] states that "the intrapharyngeal aponeurosis or fascia forms a fibrous wall in the tonsil region, lodging the tonsil and called its capsule." Güttich[4] says:

> In the histologic picture of the supratonsillar fossa no tissue, generally speaking, exists which could be differentiated as a tonsillar capsule. The tissue back of the tonsil in this region is the fascia pharyngea or buccopharyngea. It is a mistake to remove this tissue, which constitutes a supporting factor of the musculature.

Our recent Fellow and friend, the greatly lamented G. Hudson Makuen, believed that the intrapharyngeal aponeurosis and the tonsillar capsule were distinct structures and operatively separable. This belief he reiterated in a letter to me a few weeks before his unfortunate death. As many of us know, Makuen has at times exhibited tonsillectomized tonsils which clearly showed quite a thick layer of separable connective tissue over a part of the tonsillar surface. The crux in the discussion seems to be not alone that the amount of separable tissue is very variable in different tonsils, but, what is of more importance, the surface of the tonsil is never covered by loose tissue over more than a very limited proportion of its surface. Over especially the lower parts of the palatopharyngeus and the superior constrictor the capsule is thin, dense and intimately adherent both to the lymphatic tissue of the tonsil and to the muscular tissue on which it rests. The looser intrapharyngeal tissue above the tonsillar fossa extends downward and merges into the tonsillar capsule, which extends toward that tissue in this region. It appears to have been this limited extent of loose tissue above on which Makuen rested his argument.

PALATOPHARYNGEUS AND LARYNX

The exact importance of the physiology of the palatopharyngeus muscle in its relation to the thyroid cartilage, and its stretching action on the vocal cords, is at this time not clear. Theoretically its action in determining both intensity and pitch of the voice cannot be gainsaid. But the complexity of the involved conditions leaves much yet to be understood. In view of the rapid and frequent change of position of the palate, the manner of action of this muscle with respect to the thyroid cartilage is not easily comprehended. The bearing also of the salpingopharyngeus on its action is not clear. And, finally, the part played by its coadjutors, the stylopharyngeus, the stylohyoid and the hyoglossus make the subject complicated. We may well presume that a muscle so large and so definitely inserted must have a purpose with reference to that insertion, if only to adjust accurately the relations between palatal action and vocal cord action. Observation of the larynx and of its speaking voice in a large number of tonsillectomized patients in which the palatopharyngeus has been injured in all degrees has failed to show with any sort of regularity impairment in the action of the vocal cords that was visible to the eye or perceptible to the ear. The few cases of seeming physiologic impairment in the action of the vocal cords were in no sense conclusive and may have resulted from other causes. But two possible explanations of this lack of definite impairment in the movement of the larynx resulting from injury to the

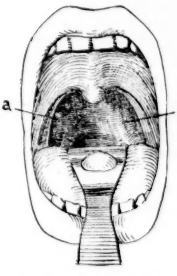

Fig. 3.—How in some throats the constrictor muscles close in at the sides on phonation to shut off the nasopharyngeal opening; *a*, mucous membrane of pharyngeal wall pushed inward by action of constrictors.

1. Kenyon, E. L., and Kradwell, W. T.: A Study of the Physicomechanical Function of the Faucial Tonsil, Ann. Ophth., Rhinol. and Laryngol., December, 1916.
2. Paterson, D. R.: Jour. Laryngol., Rhinol. and Otol., September, 1913.
3. Des Camps, quoted by D. R. Paterson: Jour. Laryngol., Rhinol. and Otol., September, 1913.
4. Güttich, Alfred: Ueber die Sogenannte Kaspel der Gaumen Mandel, Ztschr. f. Laryngol., Rhinol. u. ihr Grenzgeb., Jan. 25, 1915.

palatal section of the palatopharyngeus are possible: first, that the palatopharyngeus does not seriously affect the action of the vocal cords, at least so far as the speaking voice is concerned, or second, which is more likely, that the muscles which co-work with the palatopharyngeus in its laryngeal action come instinctively into the breach and act as a substitue for the impaired palatal muscle.

STUDY OF TONSILLECTOMIZED THROATS

The following report[5] on tonsillectomized throats is based on the systematic study of 161 tonsillectomized patients. The patients were of all ages, operated on by the various well known instrumental and technical methods, and by about twenty operators. The surgeons were mostly thoroughly experienced and some were unusually skilful; a small but unknown proportion were interns.[6]

1. Neither palatoglossus nor palatopharyngeus muscles show more than very slight retraction, namely, the faucial region on both sides, including pillars and palate, were left essentially normal; six patients, 4 per cent.

2. Both palatoglossi slightly to moderately retracted, both palatopharyngei only slightly retracted, or normal; two patients, 1 per cent.

These two groups, representing essentially one in every twenty of the patients, include all that showed the clean, free, practically normally appearing and acting fauces, such as operators theoretically attempt to secure. All others were cases presenting very evident, though by no means necessarily serious, deformity.

3. Palatoglossi moderate to marked retraction, functionating in some cases slightly, and in some cases not at all; 150 tonsils, 47 per cent.

4. Palatoglossi completely obliterated, having disappeared into the lateral wall; 122 tonsils, 39 per cent.

5. Palatopharyngeus not perceptibly impaired; 149 tonsils, 49 per cent.

6. Slight to moderate adhesion of palatopharyngeus to lateral wall, and moderate impairment of muscle; 106 tonsils, 45 per cent.

7. Marked to complete adhesion of the palatopharyngeus to the outer wall; decided and in some cases total incapacitation of muscle (with inevitable resulting tension and shortening of palate); forty-seven tonsils, 15 per cent.

As to the palatoglossus, then, in more than 50 per cent. of the cases the muscle had ceased completely to functionate, and in 14 per cent. the muscle seemed quite free from impairment. The palatopharyngeus was almost or completely incapacitated in 15 per cent., and practically not at all impaired in 49 per cent. The amount of tension, retraction, and destruction to the palate was very important, and will be brought out in other connections.

CASES SHOWING FUNCTIONAL IMPAIRMENT

A striking fact disclosed by this study is the great extent and degree of deformity possible without impairment of the speaking voice. Fauces which show very little resemblance to the normal may still disclose no perceptible impairment in this direction. In such cases the palate is apt to be unusually long; or perhaps adhesions have chanced to be favorably placed, or the palate is capable of unusual stretching. Stiffening, and adhesive retraction of the palate, on which depend voice endangerment, occurred most seriously when adhesion of both pillars happened on the same side, and more especially when both deformities appeared on both sides of the same throat.

The various ways in which the speaking voice becomes nasalized by tonsillectomy may be stated as follows:

1. Through increased tension, adhesive retraction, or destruction of the palate that organ is unable to reach the posterior wall for phonatory purposes.

2. The palate is long enough to reach the posterior wall, but, because of adhesions and tensions, the elevator muscles find the additional load so great that they do not draw back the palate the entire distance.

3. A purely functional imperfection of action of the elevator muscles of the palate (this cause would be hard to prove because of the almost inevitable presence of deformity).

4. Owing to partial or complete destruction of the posterior pillars the closure of the nasopharyngeal isthmus laterally is incomplete, and the constrictors

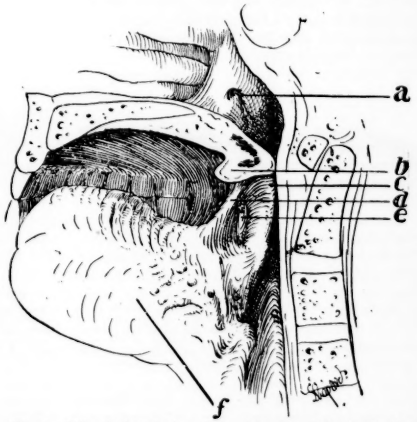

Fig. 4.—Obliquely lateral view of the right side of the throat when the soft palate is retracted in phonation, showing the action of the posterior pillar in closing off the nasopharyngeal opening laterally: *a*, eustachian orifice; *b*, uvula; *c*, posterior pillar; *d*, anterior pillar; *e*, tonsil.

have not compensated for this failure by sufficiently increased action.

The singing voice would probably be impaired in all such cases and in many others similarly deformed, although the adhesions and tensions might be insufficient to impair the speaking voice.

Thirty persons have been under observation for functional impairment of the voice, or throat, which might have a relationship to tonsillectomy. Tabulation of these cases shows:

In seven patients, voice nasalized for not less than eight months with permanent impairment to voice.

In thirteen patients, all children, voice to some extent nasalized. In some of these cases presumably the voice will be permanently impaired; in a large proportion probably the voice will clear up; in a few probably the voice results from childish carelessness.

One nasalized voice in an adult, with considerable but not extreme deformity, cleared up in about four months.

One adult has had a "tired" throat on talking, with difficulty in speaking certain words for two years, and with marked deformity.

5. Included in this report are the forty-three cases previously described by Dr. Kradwell and myself, and 118 cases recently studied. In all, 319 individual tonsils are reported on.

6. Lest this study be open to misinterpretation, it is well to say that the results most serious to the voice are in nearly every instance known not to have been the work of interns. In two or three instances of serious result the particular operator in the institution in which the operation was performed, whether attending surgeon or intern, was not learned.

One patient with "tired" throat recovered.

One patient with "tired" and "dry" throat is much improved after three months with the prospect of recovery.[7]

In one individual, an adult, one side of the tongue is paretic along its entire linear extent, but the voice is normal.

One nasalized voice in an adult seems to be purely functional, although deformity exists.

Four individuals have peculiarities of the voice probably not referable to the operation.[8]

In children the impaired throats seem to show greater capability of readjustment than in adults. The number of slightly open nasal voices in these children is notable; what proportion are due to mere childish carelessness, or to the functional effect of a former closed nasal voice resulting from adenoids, cannot yet be told. But these open nasal voices occur most often where marked operative deformity exists, suggesting an underlying organic basis. The nasalized voices may be recovered by: (*a*) gradual increased strength of action of the elevator muscles of the palate; (*b*) further stretching of the palatal tissue; or (*c*) increased action of the superior constrictors—increase in activity of this muscle seems sometimes to be confined to the side presenting marked loss of function of the posterior pillar.

RESPONSIBILITY FOR DEFORMITY

Whenever the deformities of tonsillectomized throats have come into discussion, they have uniformly been attributed to faulty methods of operating, or to lack of skill, or both. While freely granting the seriousness of bad operating, I unhesitatingly assert that even perfect operating cannot save the throat from deformity and sometimes even from serious deformity. The primary basis of deformity rests on the seriousness of the operation itself. We operate in a field complexly muscular, and when we remove the tonsil extracapsularly, Nature's carefully planned scheme of intermuscular relationship tends to fall to pieces.

Let us inquire regarding the situation in a throat which has been tonsillectomized with ideally perfect methods and skill:

1. The palatoglossus muscle becomes now suspended to an unsupported ledge of mucous membrane which, under the stress of the movements of this region and later under the adhesions and drawing of the inevitable scar tissue, must tend to sag out of its normal course toward the outer wall; here it tends to become adherent, and must often become adherent its entire distance.

2. The superior constrictor, now left unsupported with respect to its normal relationship to the tongue, the palatoglossus and the palatopharyngeus, in the stress of the violence of its natural movements, and later influenced probably by scar tissue formation, tends to be drawn into a closer bunch of overlapping muscular tissue; adjacent structures are thus pulled into more or less abnormally altered positions. We all are familiar with the manner in which the tonsillar fossa mysteriously closes up after operation.

3. The palatopharyngeus, which is the most important muscular factor in the situation, is perhaps subject to the least inevitable disturbance due to removal of the capsule. And yet, it also must be disturbed in many instances. The delicacy of this thin sheet of muscular tissue is in many cases extreme. Its relationship to the superior constrictor and the entire lateral wall is determined after operation only by its posterior layer of mucous membrane; the muscular tissue lies at its exit from the palate in unprotected close relationship to that of the palatoglossus; the inevitable movement and the later scar tissue tend to dislocate its relationship to the outer wall and to involve it in adhesions with the palatoglossus. And, more than this, owing to the closeness of adhesion of capsule and muscle fiber, the latter is apt to be torn or cut by the most skilful operator and hence the tendency to dislocation encouraged.

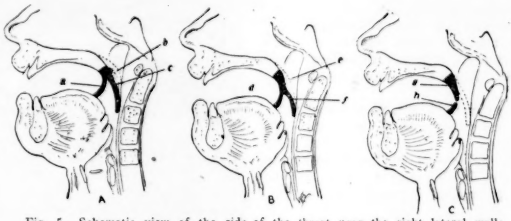

Fig. 5.—Schematic view of the side of the throat near the right lateral wall: *A*, normal; *a*, anterior pillar; *b*, position of posterior pillar when the palate is retracted; *c*, posterior pillar; *B*, retraction and adhesion of the anterior pillar holds the posterior forward moderately; *C*, posterior pillar has been obliterated; the soft palate at the side (*g*) is now ankylosed at its lower edge tightly to the lateral wall, the palate at the sides now being immobile in the position indicated; *h*, remnant of obliterated anterior pillar.

Large sized tonsils, with their greater and stronger adhesive attachments, and also tonsils supported by large connecting bands of inflammatory origin, will both tend to increase the degree of inevitable deformity. The exact estimation of this natural or inevitable deformity is, of course, impossible at this time on a large scale. If any operator will carefully follow his delicately operated cases he may make this estimate for himself.

If now we take into consideration the unavoidable difficulties which from time to time lie in the path of the most skilled operator, difficulties having reference to anesthesia, to vomiting, to anatomic variations, to field-obscuring hemorrhage, to severe bleeding, and to postoperative infection, any of which may unavoidably either interfere with, or else counteract, delicacy of operating and thus become the occasion of additional deformity, we shall understand still better the impossibility of totally preventing serious operative results. Since the house of every operator is made of glass, he may well in fairness and even in self protection respect the fragility of the house of his neighbor. Deformity capable of impairing both the speaking and the singing voice is possible to any operator. It is this uncertainty of operative deformity which renders tonsillectomy on singers always serious.

THE MECHANICS OF VOICE IMPAIRMENT

The exact manner in which the tensions and retractions and destruction operate to injure the voice may be explained thus:

1. The retraction and adhesion to the lateral wall of the remains of the anterior pillar tend to pull the palate away from the posterior pharyngeal wall and to draw its lower edge tense; if this process is bilateral,

7. Since writing this article, the "tiredness" in this throat has returned, and is extremely annoying. The patient is an adult and the operative deformity is slight.

8. Since a number of these voice cases were especially referred to me because of the voice impairment, I cannot draw conclusions even remotely as to their proportionate frequency in tonsillectomy.

both tendencies are greatly augmented. But if, under the circumstances, the posterior pillars remain intact, danger to the speaking voice probably occurs only in case of an unusually short palate.

2. When, however, the posterior pillars also become retracted and adherent to the lateral wall, and the more so if these processes be extreme, their backward pulling force, which constantly tended to counterbalance the effect of the adhesions of the anterior pillars just mentioned, becomes thereby released, and the retraction of the palate away from the posterior wall is greater. In addition, the tension of the palatal tissues is augmented, and finally, the lower lateral portions of the palate are destroyed even in extreme cases to the point of complete destruction. In these extreme cases of posterior pillar deformity, the speaking voice and, of course, the more easily impaired singing voice, is especially liable to be endangered. The singing voice is theoretically endangered by tensions, which interfere with the easy subconscious running of the speech machine, long before the speaking voice.

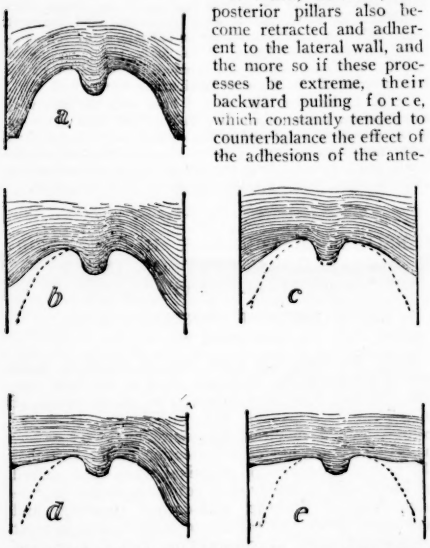

Fig. 6.—Schematic view of posterior pillar: *a*, normal; *b*, partially retracted, on one, and on both sides; *c*, completely retracted, on one, and on both sides; tension and retraction of palate progressively more marked; in order to get the full significance of this manner of deformity one must consider the backward insertion of the normal posterior pillar.

SUMMARY AND CONCLUSIONS

1. In view of the foregoing facts, any sound, conservative conclusion must show that, unless through the exercise of better technic or of greater skill, the deformities from tonsillectomy can be diminished, tonsillectomy is in a situation which if not alarming is at any rate serious. If one case of important functional impairment, for example, of the speaking voice, were known to occur inevitably in each hundred or 200 or even 300 cases of tonsillectomy, our attitude toward the operation would become much more attentive and careful than it is today.

2. In removing the tonsillar capsule we take out an important supportive structure on which the normality of the physiologic action of the soft palate largely depends. Cases in which operation has been performed, as they exist, show a frightful amount and degree of postoperative deformity, dependent in large part on the very principle of the operation.

3. Uncertainty as to operative complications leading to increased deformity is inevitable.

4. Danger to the speaking voice necessarily lurks in the very nature of the operative conditions, and impairment to the speaking voice is inevitable in an as yet unknown percentage of cases.

5. The danger to the singing voice from stiffness and adhesions begins, theoretically, long before that to the speaking voice.

6. The present situation calls for further intelligent efforts applied to technic and delicacy of procedure, and possibly to greater care in lessening postoperative scar tissue, in the hope that the adhesions and tensions may be decreased. In the meantime the dangers to the possibilities of the artistic voice in children must apparently continue. But, until the situation is further cleared up, for the surgeon to go on performing indiscriminately tonsillectomies on the throats of adults with singing voices of great beauty or of great importance to their possessors is for him to take risks which the artist himself would not consent to take did he know clearly the situation.

7. The weakness of the present professional attitude in favor of the exclusive employment of the extracapsular operation lies in the fact that no evidence exists which proves that an operation aiming at a clean complete intracapsular lymphidectomy, namely, complete removal of lymphatic tissue within the capsule, might not prove to be practically as capable of eliminating infective dangers as the present extracapsular operation. And such an operation would not only be free from serious deformity, but would be altogether a less serious operative procedure. The opinion of French[9] that 80 per cent. of tonsils could as well be operated on without extreme radicalism is probably true, and could probably be verified.

8. In view, then, of the whole situation, and granting for the moment the correctness of the facts herein presented, must not the profession in justice to its scientific aims and mission turn toward the matter of developing a thorough though relatively conservative operation, which preserves undisturbed the tonsillar capsule? If such an experimental attempt should meet with success, as it probably would, the operator would have at his disposal both a conservative and a radical operative procedure, between which in the individual case he could make a rational choice. Such an operation could practically always be employed in singers.

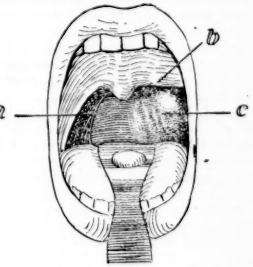

Fig. 7.—On the right side the anterior and posterior pillars are normal; on the left side both the anterior and posterior pillars have been entirely obliterated; *a*, posterior pillar; *b*, deformed edge of soft palate; *c*, lateral action of the constrictor muscles attempting to take the place of the posterior pillar in closing the nasopharyngeal isthmus laterally, the palate being in the retracted position.

104 South Michigan Avenue.

9. French, T. R.: Tonsillotomy versus Tonsillectomy, New York Med. Jour., Dec. 5, 1914.

ABSTRACT OF DISCUSSION

DR. I. W. VOORHEES, New York: No one man can ever decide such a momentous question as this, and especially so if he is not a trained vocalist or elocutionist, or if he is not collaborating with vocal experts. I have been frequently surprised to see destruction of the function of the anterior or posterior pillar, with no singing or speaking impairment, while in other cases having a good anatomic, postoperative result, vocal impairment was complained of. The personal equation of the patient seems to enter largely into this question. Every physician deems himself capable of operating on tonsils and adenoids. Is it not surprising that the results of incompetency are not more manifest? If functional impairment were as common as the essayist would have us believe, removal of tonsils and adenoids would long ere this have ceased. The term "nasalized" voice needs definition. A part, at least, of every good tone is resonated through the nose. In true nasalization all of the tone goes through the nose, instead of part through the nose and part through the mouth. When the nasopharynx is held open by a forward-fixed soft palate, this is possible, but in most mutilations the soft palate is pulled upward and backward. Poor results sometimes follow a good operation, and a good functional result may follow a rather poor operation. We must standardize our technic. Too many instruments have been devised for doing the same thing. Laryngologists should get together and prescribe a classic procedure with such modifications as are necessary for unusual types of cases. Then the man who violated these principles in striving to be too original would lay himself open to censure and, perhaps, legal action at the hands of his victims.

DR. WALTER B. SWIFT, Boston: It seems to me that in relation to the soft palate the chief thing to secure is occlusion. If one can operate so that easy occlusion is finally secured, the nasality is eliminated. Of course, the great danger in operating in these resonance chambers is the destruction of quality. Quality in the voice is that part which comes from the emphasis of overtones; not only that, but from the emphasis of tones which, if combined, make beautiful quality. Now, it is the variation in these resonance chambers (the nasal cavities) which destroys this relationship resulting in quality. I think that the acoustic background should be held in mind while doing this operation, especially in singers, because the great danger comes in removing any large mass of tissue, no matter where, that is in the resonance chambers. By that removal the chambers are varied, and thus the overtones which make the quality are destroyed. I would, therefore, sum up as the end and aim of any operation with relation to the speech or singing voice, that the change of cavity and the change of action should be avoided as far as possible; or constrictively put, preserve the cavity relations and functional muscle actions.

DR. H. P. MOSHER, Boston: I believe we have not reached the end of the technic in the tonsil operation. My results have not been satisfactory to me. I feel that another operation must come; that we should, as the essayist said, have two operations to fall back on—a complete operation for sepsis and an incomplete operation when we are dealing with a trained voice; and I make the prediction that in the future somebody will give us a modified technic whereby a part of the capsule is left in the tonsil fossa, probably the superior part.

DR. JACOB BRAUN, New York: Makuen, basing his statements on the work of Patterson, adopted the theory of the layer formation of the tonsil capsule. This I have been able to verify clinically. The capsule is split and when the tonsil is removed should be covered by a very thin layer of areolar tissue, the thicker aponeurotic tissue remaining to line the fossa. By obviating the removal or injury of this thick aponeurotic tissue, which is part of the intrapharyngeal aponeurosis, the palatal muscles and the superior constrictor are not exposed to traumatism, and infection is avoided and the amount of scar tissue very greatly diminished. Thus the resultant contraction and distortion are not as likely to occur. Another factor in avoiding deformities as a result of the operation is the conservation of as much of the mucous membrane of the fossa as possible, removing only as much as actually covers the surface of the tonsil. By doing this one-eighth to three-eighths inch of mucous membrane on the inner surface of the anterior pillar and the anterior surface of the posterior pillar may be conserved, resulting in folded over pillars and retaining the normal contour of the fauces. The requisites, therefore, for a good functional and cosmetic result following tonsillectomy are an untraumatized and uninjured smooth fascial lining in the fossa, the minimum of mucous membrane injured and removed, which result in the least amount of scar tissue formation and contraction.

DR. E. L. KENYON, Chicago: I have seen the layers of extracapsular tissues which Dr. Makuen laid such stress on in the dissecting room and in the excised tonsil, but I have never seen them extending below the middle plane of the tonsil, and I do not believe the amount of loose tissue which could be saved would preserve the throat from deformity.

PERSONAL EXPERIENCE IN THE SURGICAL TREATMENT OF INTESTINAL STASIS *

J. SHELTON HORSLEY, M.D.
RICHMOND, VA.

Since Sir Arbuthnot Lane brought intestinal stasis into prominence, the literature about it has been prolific. It has been approached from many points of view—surgical, medical and pathologic. It is, of course, an old condition masquerading under a new name. Smithies has called attention to the fact that the typical symptoms of intestinal stasis as described by Lane, such as muddy skin, headache, mental depression, lack of appetite, malodorous sweating, and abdominal aches and pains, are often absent in most pronounced cases of constipation, and that marked displacement of the large bowel, as demonstrated by the Roentgen ray, does not always cause constipation. Pathologists generally have not sustained the extreme views of Lane. That the symptoms as described by him do often exist, however, is common experience, but that they are caused by such marked changes in the colon as to demand its entire removal remains to be proved.

Patients that are now classed as stasis cases were formerly condemned and avoided professionally and were labeled "abdominal neurasthenics." The serious treatment of these patients dates from the recognition of bands and of stasis by Lane, and from papers by Stanton, who brought forcibly to the attention of the medical profession the unsatisfactory results of operations for so-called "chronic appendicitis" in which the appendix was removed through a short incision and no other exploration was done. Stasis, whether due to a band, ptosis of the colon, or kinks, may cause the same general complaints; consequently, the operations employed to relieve similar symptoms may be quite different.

All cases of intestinal stasis should be treated by a competent medical man several months at least before surgery is resorted to. If after six months of intelligent medical treatment little or no benefit is obtained, operation should be recommended. This has been the criterion for surgery in the group of cases here reported; each case has been treated medically for several months, usually for several years, before operation was advised.

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

The best method of determining the value of any surgical procedure is the careful analysis of a group of cases in which this operation has been employed. No real improvement can be made until this is done, for often one may have the impression that certain operations are satisfactory when accurate statistics will show exactly the reverse. Frequently, unusual results in a patient in whom a surgeon is particularly interested will make, in regard to a whole group of cases, a subconscious impression that may be quite erroneous.

This group of seventy-four cases dates from Feb. 20, 1912, to Jan. 1, 1917. Reports have been received within the last sixty days from all except three. In this series are included all of the Coffey, or hammock, operations, and all short circuiting operations performed within this period of time, except for cancer or tuberculosis; but only a small portion of the cases with bands has been included—only those in which there has been a very decided history of constipation, digestive troubles, and such other symptoms as usually make the clinical picture of intestinal stasis.

Probably no two groups of surgical statistics are analyzed in exactly the same way, and their value, especially when the results are based on the statements of the patients and not on obvious physical examination, as in recurrence of cancer, depends as much on the manner in which the statistics are accumulated as on their interpretation afterward. The report of the final results here largely depends on what the patients think of their condition. This, of course, is not entirely accurate, but in a group of such cases it is the best that can be done. Several, for example, that are classed as "unimproved" apparently are better. In three instances, particularly, the friends and family physician of the patients think they are better, while the patients themselves report no improvement, so they are listed "unimproved." Others, doubtless, feel so much gratitude for the relief they have obtained that they probably make their report more rosy than it should be. After all, these two factors largely offset each other. When the family physician thinks the patient is not improved as much as the patient reports, the physician's statement is preferred.

The cases have been classified as "greatly improved," "improved," or "unimproved." The term "cured" has been avoided chiefly because it might be questioned whether, in view of the comparative newness of the surgical procedures, there may not be a recurrence of the symptoms, though this is hardly probable in any large percentage of cases. The cases that are marked "improved" are those in which a considerable proportion of the symptoms have been relieved or markedly benefited. Naturally these two types blend into one another, but it has been my endeavor conservatively to class as "greatly improved" only those patients who are practically well or have only one or two minor symptoms that have not been benefited. The classification of "unimproved" consists of those in whom there is frankly no improvement or in whom the improvement has been so slight as hardly to justify other classification.

Each patient and each patient's family physician were sent a stock letter requesting a report of the patient's condition and whether the symptoms have been relieved since the operation. Two symptoms particularly inquired about were change in weight and the presence or absence of constipation, as these are less subject to psychic influences than the more indefinite complaints of nervousness, headache and abdominal pain, and hence they may be considered a fair indication of the patient's real condition.

The replies from the patients and physicians have been tabulated and are on record, but for lack of space only a few will be reproduced. The following two letters are from patients classed as "greatly improved," of whom there are thirty-four:

REPORT OF CASES

CASE 1.—J. L. R., man, aged 28, had been constipated for twenty years, and had gas on the bowels for the past seven years. Recently he had had attacks of diarrhea alternating with constipation, and had suffered from sick headaches. Everything he ate disagreed with him. There was an itching sensation about the rectum which extended to the thighs and between the toes. The operation consisted of removal of the appendix, division of a Lane band, freeing adhesions around the sigmoid, and draining the gallbladder. Twenty-three months after the operation the patient reports as follows: "Gained 50 pounds. Began to take on weight about six months after the operation. Have had no sick headaches and very little constipation. Before the operation I had no appetite and rarely felt well. Now I eat anything but nails with great relish and I do not believe there is a living man who feels better than I do."

CASE 2.—Miss B. P., aged 26, gave a history of having had severe constipation since she had measles four or five years ago. She suffered with indigestion, gas, large lumps in the stomach followed by vomiting, much mucus in the stools, and headache and dizziness for several days at a time. She also had dysmenorrhea. She would take large doses of purgatives with but little effect, the bowels moving about once a week under strong purgatives. The appendix had been removed previously without benefit. The Coffey operation was performed, as the colon was in the pelvis. The patient reports four years and three months after operation: "Gained 60 pounds. Began to gain immediately. Health has been almost perfect since the operation. Occasional spells with bowels. They swell up and cause some pain, but this does not last very long."

From the replies of those patients classed "improved," of whom there are twenty-four, the following letter is typical:

CASE 3.—Mrs. T. J. C., aged 30, gave a history of having been constipated for ten years. She had nausea, occasional vomiting, indigestion and nervousness, and had headaches all her life. The uterus was curetted, the Coffey operation performed, and a retroverted uterus was replaced by the Gilliam operation. Four years after the operation the patient reports: "My general health is considerably impoved. Have gained about 10 pounds. This gain began about a year after the operation. Constipation and headache has been improved, but still have spells of both. The constipation is not so bad, but the headache is very severe at times. The spells of headache do not come so often. Still have pains in the groins, but not so severe."

From the "unimproved" class, of which there are nine cases, the following report seems typical:

CASE 4.—Mrs. W. S., aged 41, had been obstinately constipated for thirty years. Medicines failed to give the desired result after about a year. About eighteen years ago there was a fulness in the rectum which has grown worse. For the last eight years the patient had suffered constantly. She used the rectal tube for relief from pressure in the rectum. She had hemorrhoids, and suffered with sick headaches, nausea and vomiting. An appendectomy and a cecosigmoidostomy were performed. The right tube was totally resected, and the left tube partially so. A small cyst was removed from the left ovary. Two years and one month after the operation the patient reports as follows: "It is with regret that I must say that it [the operation] has proved to be of no benefit whatever. I gained in weight what I lost from the operation.

Constipation has been as great as before. Headache is the same as ever. Am never relieved from awful pressure in the rectum; my nights are bad; I get about one good night's rest in every two weeks. My limbs and arms down to my little fingers feel like they are going to be paralyzed. I have to continue the use of the rectal tube for relief."

In eight instances the ultimate result has been reported by the physician alone, the patient not being heard from. In thirty-four cases the reports have been based on replies from both the family physician and the patients, and in twenty-five on replies from the patients alone. Of the whole series of seventy-four cases, three have not been heard from. Four of the series have died. One died of pneumonia two years and two months after leaving the hospital, and three died while in the hospital. Of these three, one patient died of pneumonia four days after the operation, and another died suddenly of what appeared to be pulmonary embolism twelve days after the operation. She had been feeling well only a few minutes before death. Both of these deaths followed a Coffey operation. There was no postmortem in either case. The third patient had been vomiting occasionally ever since the operation. A few hours before his death the pulse quickly became rapid and feeble and the vomiting frequent. There was little distention, but marked pain. He died from what appeared to be some form of "heart failure." In this case, which was one of obstinate stasis with constipation, headache, abdominal and general pains and inability to perform the usual labor, the cecum was anastomosed to the sigmoid. There was some thickening of the ascending colon. The cecum was not unduly large, and there was not sufficient play between the sigmoid and the cecum after the anastomosis had been made. Postmortem examination revealed several loops of ileum wrapped around the point of anastomosis had produced such tension on the line of sutures that a perforation had resulted, evidently a few hours before death, when the bad pulse and other symptoms occurred. This was one of the early cases, and the necessity of having an extremely large and movable cecum and sigmoid for cecosigmoidostomy was not fully appreciated. Since then no cecosigmoidostomy has been done except with a large dilated cecum, extremely movable, and when both the sigmoid and the cecum could be brought well out of a median incision, showing great relaxation of both these segments of the intestine. This is the only death that could reasonably be attributed to the technic, and I think, in view of past experience, that it would be avoided now. If I have a similar case, I shall resect the cecum and the ascending colon.

In the seventy-four cases, there are sixty-one women and thirteen men. They are subdivided into cases in which operations were performed as follows: appendectomy and division of bands, 22; Coffey or hammock operation, 27; cecosigmoidostomy, 17; Coffey and cecosigmoidostomy, 5, and ileosigmoidostomy, 3.

Many of these patients had been called "neurasthenics." The term "neurasthenia," like malaria, "liver complaint" and rheumatism, often covers a multitude of sins. The more carefully such patients are examined the fewer so-called idiopathic neurasthenias are found. Certainly, in the type classed by some as "abdominal neurasthenics," stasis is a frequent cause. Many of this type have been practically cured by operation for stasis. With one such patient, on whom the Coffey operation was performed, the attending physician was as anxious for relief as the patient was, and a gain of 60 pounds within six months after operation was accompanied by a practical cessation of neurasthenic complaints.

Why, then, are not all neurasthenics with intestinal stasis cured by a surgical operation? For instance, in three of the unimproved patients in this list, such symptoms as mental depression, constant introspection, constipation, headache, emaciation and abdominal aches and pains were present in a marked degree before operation; and while there are apparent benefits from the operation according to the observations of the physician, friends and relatives of the patients, the patients themselves report their condition as unimproved and they are so classified. It seems possible that as regards cure by relieving the original cause, the situation is somewhat similar to that which obtains in traumatic epilepsy. It is well known that if epilepsy has become firmly established after such a trauma as a depressed fracture of the skull, the correction of the causative lesion does not often cure the epilepsy. If, however, the lesion is corrected after the first one or two convulsions, the chances of complete relief are much greater. There may be some such connection between abdominal neurasthenia and intestinal stasis, for the toxic products evolved by stasis evidently have some effect on the nervous system that is responsible for many of the complaints of the neurasthenic. If this condition is permitted to go too long, such permanent changes may take place in the nerve cells as to prevent a cure, though by the establishment of normal metabolism and the elimination of the toxic products of stasis some improvement takes place.

It is difficult to compare the results if viewed solely according to the type of operation, for, as has been said, similar symptoms were often produced by different pathologic conditions. Stasis can be caused by bands, kinks, ptosis, a cecum mobile, or a combination

TABLE 1.—OPERATION AND RESULT*

Operations	No. of Cases	Greatly Improved	Improved	Unimproved	Dead	No Report	Youngest Years	Oldest Years	Average Age, Years	Men	Women
Appendectomy and Lane band	22	13	8	0	0	1	18	57	32	7	15
Coffey	27	12	10	2	2	1	21	55	32½	2	25
Cecosigmoidostomy	17	6	4	5	1	1	18	41	28½	4	13
Coffey and cecosigmoidostomy	5	3	0	2	0	0	28	48	36	0	5
Ileosigmoidostomy	3	0	2	0	1	0	27	34	30½	0	3
Total	..	34 (46%)	24 (32.5%)	9 (12%)	4 (5.5%)	3 (4%)	..	..	..	13	61

* All of these patients were white except one, who was a colored man.

of these. Consequently, the type of operation was fitted to the condition found. Cases in which bands exist without ptosis have frequently been classified under the head of "chronic appendicitis." These patients were formerly operated on by a short incision, and the appendix was removed. As Stanton and others have emphasized, often little permanent benefit results from this. It is doubtful if such a condition exists as chronic appendicitis without a distinct history of an acute attack, or without bands, kinks or some other pathologic condition. The removal of the appendix is undoubtedly indicated, but freeing bands and correcting other pathologic conditions are even more necessary. Appendectomy was done in all stasis cases reported here, regardless of the type of operation.

The three ileosigmoidostomies were performed early in the series. In one case, Kellogg's suggestion of an end-to-side implantation of the ileum in the sigmoid in such a manner as to form a valve was carried out, and this patient seemed to be somewhat benefited. She died of pneumonia two years and two months after the operation. Ileosigmoidostomy, however, was soon abandoned, as cecosigmoidostomy seemed to be far preferable. J. Rilus Eastman[1] has called attention to the value of this operation. Anastomosis between the cecum and the sigmoid not only provides for short circuiting, but has the additional advantages of draining a large cecum and of protecting the ileum from the flora of the large bowel. Several surgeons have reported that after an ileosigmoidostomy, the lower ileum enlarges, thickens, and apparently takes on some of the characteristics of the large bowel. This may be due to the ready access of the bacteria that are abundant in the large intestine, and partly also to the pressure of gas in the colon. By preserving the ileocecal valve, as in cecosigmoidostomy, these changes in the ileum are avoided. In addition, cecosigmoidostomy prevents the accumulation of fecal matter in the blind pouch of the cecum, which is a great objection to the Lane operation of short circuiting (ileosigmoidostomy). James T. Case[2] reports a patient observed after a cecosigmoidostomy in whom the peristaltic and antiperistaltic currents of feces would produce a vicious circle. It has also been objected that the opening between the sigmoid and the cecum tends to close, and John G. Clark of Philadelphia and others say that but little if any fecal matter comes through the opening. At least some of the fecal current and some gas should drain into the sigmoid, and this should aid in emptying the cecum, just as a gastro-enterostomy aids in draining a dilated stomach. If the opening closes eventually but has remained patent sufficiently long to cause reduction in the size of the cecum, this improvement may be permanent. In the only cecosigmoidostomy in this series, however, in which, because of a return of symptoms, a roentgenogram was taken several months after operation, the opening appeared to be closed.

While intestinal stasis rarely calls for an extensive resection of the colon—in my own experience I have never seen a case in which I thought this should be done—there are probably instances in which excision of the cecum and ascending colon are indicated, particularly after a failure following cecosigmoidostomy. In two patients an excision of the cecum was advised; but as there had been no benefit from the first operation, it was refused. If it is done, the operation of W. H. Barber,[3] that is, preserving the ileocecal valve along with a small amount of adjacent cecum and joining this end-to-end to the stump of the ascending or the transverse colon, seems far better than the technic usually employed, namely, lateral anastomosis or end-to-side union without the protection of the ileocecal valve. As I have attempted to show elsewhere, the operation of lateral intestinal anastomosis should be abandoned.

TABLE 2.—LENGTH OF TIME SINCE OPERATION

Operation	Result	5½ to 4 Years	1 to 3 Years	3 to 2 Years	2 to 1 Year	1 Year to 5 Months
Appendectomy and Lane band, 22 cases. Reported 21; no report, 1; dead, 0.	Greatly Improved	2	1	5	2	3
	Improved	1	0	5	2	0
	Unimproved	0	0	0	0	0
Coffey, 27 cases. Reported, 26; no report, 1; dead, 2.	Greatly Improved	1	2	3	3	3
	Improved	5	0	3	2	0
	Unimproved	0	0	0	2	0
Cecosigmoidostomy, 17 cases. Reported, 16; no report, 1; dead, 1.	Greatly Improved	0	0	1	4	1
	Improved	0	0	1	2	1
	Unimproved	0	0	4	1	0
Coffey and cecosigmoidostomy. Reported, 5; no report, 0; dead, 0.	Greatly Improved	0	0	0	2	1
	Improved	0	0	0	0	0
	Unimproved	0	0	2	0	0
Ileosigmoidostomy, 3 cases. Reported, 2; no report, 0; dead, 1.	Greatly Improved	0	0	0	0	0
	Improved	2	0	0	0	0
	Unimproved	0	0	0	0	0

In regard to ptosis, the Coffey, or hammock, operation is most satisfactory. In eight cases, a few sutures were placed in the gastrohepatic ligament, according to the method of Beyea, just before the Coffey operation was done. This held the stomach in position.

The condition of the patient and the amount of time that has elapsed since the operation was performed are classified in Table 2. According to this table, there is apparently no material increase or decrease in benefit with the lapse of time.

On the whole, I have found that cases with distinct bands and kinks without ptosis and without a dilated cecum give very satisfactory results from operation. The Coffey, or hammock, operation for ptosis when there is no dilatation of the cecum is also exceedingly satisfactory. The results from cecosigmoidostomy, though fairly good, have not been so good as in those cases in which only the Coffey operation was done.

1. Eastman, J. Rilus: An Anatomic and Physiologic Method of Short-Circuiting the Colon, THE JOURNAL A. M. A., March 7, 1914, p. 747.

2. Case, J. T.: Roentgen Studies After Gastric and Intestinal Operations, THE JOURNAL A. M. A., Nov. 6, 1915, p. 1628.

3. Barber, W. H.: Interstate Med. Jour., 1917, **24**, No. 1.

The number of cases in which only cecosigmoidostomy was done is seventeen, the report showing five patients unimproved, four improved and six greatly improved, while after the Coffey operation alone there were two unimproved, ten improved and twelve greatly improved. This does not necessarily mean that cecosigmoidostomy is less efficient than the Coffey operation, but that the cases in which it was indicated, because of a large distended cecum, are probably more difficult to cure than those in which there is ptosis of the transverse colon with but little change in the cecum. However, I am now restricting the cases in which cecosigmoidostomy is done, and I think that in future many of the same type in which I have previously performed this operation will be more benefited by an excision of the cecum and ascending colon.

Taking the general results, thirty-four patients have been greatly improved, twenty-four improved and nine unimproved. Three of the patients have not been heard from. There are four deaths, three while in the hospital, and only one that could be attributed to the technic of the operation. It is probable that death would not occur in a similar case now. All of these patients had been treated for a number of months, and many of them for several years, by medical measures with practically no benefit before operation was resorted to.

Finally, I have been impressed with the value of cooperation between the physician and the surgeon in this class of patients, particularly in the after-treatment. The regulation of diet, proper methods of personal hygiene, the ingestion of an abundance of water and the administration of liquid petrolatum should be carefully followed. This will be done only under the supervision of the family physician. Before operation, the same measures gave slight if any improvement in this group of cases; but when the pathology was corrected by surgery, they usually produced most gratifying results.

ABSTRACT OF DISCUSSION

DR. JOHN W. DRAPER, New York: I want to show a series of three plates brought to me by Dr. Robert M. Brown who will tell you something further about them. The plates serve to show the truth of what the essayist has said, that frequently following cecosigmoidostomy there is dilatation of the intestines. I have followed Dr. Whipple's work carefully but have failed to corroborate his theory of proteose intoxication in obstruction, and am able to present to you this outline which shows the chemical blood picture in duodenal obstruction dogs. The rise in nonprotein nitrogen is immediate and characteristic, as is also the fall in alkaline reserve. One would not expect this sort of reaction in any bacterial condition. It is significant proof that whatever the toxemia is, it is not bacterial. Dr. Horsley spoke of the rôle of the valves. I do not consider the terminal portion of the intestine, where there is normal physiologic delay, as a mere mechanical structure. I believe the ileocecal sphincter is 90 per cent. physiologic and 10 per cent. mechanical or valvular in action. I agree with Dr. Horsley in many of these things, but do not believe that lateral stomata functionate unless the normal lumen is closed just aboral to them. Except by such actual obstruction, it is not easy to divert the course of the intestinal contents.

DR. ROBERT M. BROWN, Saranac Lake, N. Y.: In one of my cases, referred to by Dr. Draper, there was a history of constipation since the patient was a girl. Hydrotherapeutic treatment was given with some improvement at the time, when there was a recurrence and the same symptoms of profound autointoxication, the patient losing ability to attend to her home and to run her affairs, constant, increasing headache, nausea and serious loss of memory. Cecosigmoidostomy was performed by a competent man. Before leaving the hospital the patient said her symptoms were worse than before. When she came to me she had a list of cathartics covering everything in the pharmacopeia. One of the slides showed the patient after having been given a bismuth enema. An hour after the bismuth had been taken it was found in the descending colon. Following it for a hundred hours, part of it dropped out and passed through the rectum each time it came around the cycle. Another picture showed the bismuth enema and where the stomata were situated. Dr. Draper and I operated one year ago as follows: We resected the immensely dilated pelvic colon and reunited the ends. The usual developmental reconstruction of the colon was then done, the ileum being transplanted by lateral anastomosis into the transverse colon, after removal of the grossly diseased cecocolon. The total mass resected was the length and diameter of a man's coat sleeve. Nothing short of resection would have helped this woman, who for years before operation had been in the hands of very competent medical men. Since operation the patient is getting better very day. At present she is taking 5 grains of cascara about twice a week and the bowels are moved normally. While her physical improvement has been over 80 per cent., still more marked has been the mental gain.

THE DIAGNOSIS OF ACUTE PANCREATITIS

WITH A SPECIAL STUDY OF THIRTY-THREE CASES *

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In presenting this report of thirty-three cases of acute pancreatitis, gathered almost entirely in the very short period of three and a half years, it is my desire to arouse an interest in this condition and to demonstrate that to think of the possibility of acute pancreatitis in every acute case demanding abdominal surgery is to frequently make a diagnosis. Errors of diagnosis here are mainly those of omission.

There are more cases of the mild or the moderate type than of the severe fulminating type. We wish to call particular attention to the milder types, as very frequently they precede the fulminating syndrome.

While Körte and Barker state that males outnumber females in the ratio of 2:1, in this series 76 per cent. of the patients were females.

The most potent factor in the causation of acute pancreatitis is, no doubt, gallbladder disease, including cholelithiasis. The frequency of association of biliary and pancreatic diseases has been variously estimated by different authors. In this series this was true of approximately 50 per cent. of the cases. This percentage would probably be higher were I to consider that in some of the cases the condition of the patient was so desperate that, on the principle of going in and getting out of the abdomen as quickly as possible, no time was wasted in examining the gallbladder or ducts, or in doing more than establish pancreatic drainage.

What is the explanation of these associated lesions? Here a knowledge of anatomy and the relationship of the gallbladder, the pancreas and their respective ducts, is of prime importance. Infection of the gallbladder continues along the ducts and secondarily infects the pancreas. This is especally the case if a small gall-

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

stone becomes impacted in the papilla of Vater and this results in a damming back of the infected bile into the duct of Wirsung. This has received confirmation at the hands of numerous workers. Other causes of obstruction at the ampulla, such as duodenitis or neoplasm, may also favor the entrance of bile into the pancreatic ducts. Déjerine believes that an infection that at one time can ascend the biliary ducts can at another time attack the pancreatic ducts. Deaver states that in 25 per cent. of cases not secondary to biliary disease, acute pancreatitis may follow appendical or other intra-abdominal infection by lymphatic extension and produce a pancreatic and peripancreatic lymphangitis.

The classification of the different types of lesion, as described by Fitz in 1899, holds good today and cannot be improved on. Acute hemorrhagic, acute gangrenous and acute suppurative pancreatitis are all phases of the same condition and not distinct pathologic entities. In any of these types part or all of the gland may be involved. We shall study the different types in the light of what is revealed on the operating table. It is the living pathology that interests us as surgeons, for should the diagnosis have been missed before the opening of the abdomen, there is no excuse for overlooking the condition when the abdomen is opened.

The symptoms of the onset are due to celiac shock and diaphragmatic irritation by pressure on an enlarged pancreas and hemorrhagic exudate. The later symptoms are those of a peculiar toxemia, the nature of which has not yet been clearly defined. The clinical history of the past condition of the patient will frequently reveal symptoms pointing to a cholecystitis, cholelithiasis, cholangeitis or a mild pancreatic attack. Twenty per cent. of the cases give a history of typical biliary colic, 50 per cent. of mild pancreatic attacks, and a large majority give a clinical history simulating gallbladder dyspepsia. We were formerly taught to recognize only the fulminating type.

The onset of a severe attack is intensely dramatic. Like a thunderbolt out of a clear sky, in a robust, obese and apparently healthy individual there is sudden upper abdominal pain, accompanied by vomiting, rapid and marked collapse and shock. Marked constipation and abdominal distention, simulating intestinal obstruction, follow at once. Symptoms of pseudo-ileus progress and there is marked cyanosis and lividity, shallow breathing and marked dyspnea. The pulse is rapid. The pain, which was at first excruciating in character, may, after twenty-four or forty-eight hours, abate. The vomiting, which is persistent during the first twenty-four hours, also lessens, while the hiccups and belching, which are due to diaphragmatic irritation, persist.

In the event of the patient surviving a severe attack, after a period of three or four days symptoms of gangrene or suppuration may supervene. The hyperacute symptoms subside and the phenomena of acute upper abdominal peritonitis appear. Usually there is marked obstipation, the result of toxic ileus; the abdomen is distended; there is tenderness in the epigastrium and left lumbar region with slight rigidity of the left rectus, and a swelling in the epigastrium or the left lumbar region may appear. If suppuration ensues, fever, chills, a high leukocytosis, weakness and emaciation make their appearance.

The moderately severe or the mild types of acute pancreatitis can be diagnosed only by a close study and an analysis of the individual symptoms. I here desire to reiterate that to think of acute pancreatitis is to frequently make the diagnosis.

While it has frequently been said that there is nothing pathognomonic about any sign or symptom which would lead to a diagnosis of acute pancreatitis, there is no pathognomonic sign or symptom in any abdominal condition. It is the correlation of the syndrome and the analysis of each and every individual symptom that renders the diagnosis comparatively easy in the moderately severe or the mild types.

Pain is the predominant and the persistent symptom and should be spoken of in the comparative degree. It is more severe than in a perforated gastric or duodenal ulcer or a perforated gallbladder, and usually requires a large dose of morphin to afford relief. During the attacks of pain the patient refrains from indulging in the slighest exertion, and this serves to differentiate it from the severe pain of renal colic. At the onset pain is the dominant symptom and continues to grow worse and is constant. It is of a splitting character, often as if the ribs were being pushed apart. At the time of onset the pain is usually located deep in the midepigastrium, just above the umbilicus. It often radiates to the back, and the patient complains of a splitting backache. It never radiates to the right shoulder. Vomiting accompanies and follows the pain, recurs at intervals in 80 per cent. of cases at the onset, and the vomited material consists of bile. Vomiting ceases within a short period. As compared with intestinal obstruction, the vomiting is not progressive and is relieved by gastric lavage.

Collapse and shock are due to pressure on the celiac plexus. They vary in intensity and in the severe cases are marked at the onset, as compared with the later appearance of collapse in intestinal obstruction. Shock may be so extreme that the patient may die in a few hours. Shock is very prolonged—more prolonged than in the case of a perforated viscus. The period of shock is usually followed by exterme prostration, nausea and vomiting, weak and rapid pulse, cyanosis and marked systemic depression. These phenomena of shock, when unaccompanied by abdominal findings of a severe perforative peritonitis, are suspicious or diagnostic of acute pancreatitis. Twenty-five per cent. of the cases that are sent to us are referred as cases of intestinal obstruction. The reason for this is the fact that a toxic ileus is very frequently present at the onset of the attack. It can be readily differentiated from mechanical intestinal obstruction by the passage of flatus, absence of increased peristalsis and lack of progressive vomiting. A finding of extreme importance, which, in itself, is very suspicious, is the presence of a peculiar cyanosis and lividity of the face, the abdominal wall and the flanks.

Physical examination reveals a tense and swollen abdomen, due to rapidly increasing distention, especially of the upper abdomen. This is marked in 50 per cent. of the cases and is due to intestinal paresis. Abdominal tenderness is located in the upper abdomen, especially in the midepigastrium. The tenderness is not as great as in a perforated viscus. Rigidity is absent at the onset. It appears early as a transverse resistance in the epigastrium and left rectus muscle. As compared with a perforated viscus it is less marked and rarely of a boardlike character. An abdominal tumor never appears before the third day, and this differentiates it at once from the early appearance of an acutely distended gallbladder. When present, it is due in small part to the swollen pancreas, but mainly

to the exudate about a gangrenous pancreas, it being the expression of a localized peritonitis in the lesser sac. It is felt as an indefinite mass, extremely tender, situated in the midepigastrium above the navel, and because of the overlying stomach and colon, has a dull tympanitic note on percussion. Tenderness in the left costovertebral angle is of extreme diagnostic importance and invariably means involvement of the tail of the pancreas. This sign is important when taken in conjunction with the other signs. An attempt to elicit this sign should be made in all cases of acute pancreatitis. The temperature is also a diagnostic feature, differentiating it from a spreading peritonitis, in that it is normal or subnormal at the onset and only becomes elevated if suppuration or gangrene occur later on. The blood shows a marked leukocytosis and polynucleosis, which persist in the gangrenous cases, even if the temperature remains normal.

Given a case suspicious of acute biliary colic or acute gallbladder disease, it is absolutely essential to consider the possibility of an associated pancreatitis. The pain of acute pancreatitis is greater, of longer duration, spread over a wider area, persists and grows worse, begins and is most severe in the epigastrium and is early associated with collapse, cyanosis, epigastric and left lumbar tenderness, absence of rigidity and absence of early palpable tumefaction.

OPERATIVE FINDINGS

In a given case of acute upper abdominal disease simulating acute gallbladder disease or intestinal obstruction high up, when the abdomen is opened and the abdominal findings, such as palpation of the gallbladder or the absence of an obstructed loop of intestine are negative, you must at once look to the pancreas to explain the syndrome, and here one will find:

1. A peculiar odorless "beef broth" fluid in the peritoneal cavity. This was present in 60 per cent. of our cases.

2. Spots of fat necrosis, which appear as warty, yellowish-white plaques on the mesentery, the omentum or the pancreas. These, when present, are absolutely pathognomonic of acute pancreatitis. Frequently it will be found necessary to expose the pancreas to find fat necrosis. Fat necrosis is explained as follows: Hemorrhage within the gland destroys the acinous epithelium and basal membrane and allows the activated fat-splitting ferment to get into the tissues and split up the fats into fatty acids and glycerin. These fatty acids, when combined with the calcium salts in the blood, result in the deposition of insoluble calcium soaps, which appear as spots of fat necrosis.

3. Marked cyanosis of the small intestine, in the absence of mesenteric thrombosis or mechanical obstruction, is very suspicious and should lead to an investigation of the pancreas.

4. A change in the consistency of the omentum, the loss of its peculiar oily or fatty feel, and the acquisition of a peculiar granular or gritty consistency. This sign was first described by me in 1914 before the Brooklyn Surgical Society.

5. The pancreas is soft, enlarged and thickened, and on exposure shows areas of fat necrosis or dark areas of hemorrhagic fluid beneath its peritoneal covering.

PROGNOSIS

The prognosis depends on the recognition of the mild or the moderately severe type of the disease because it is then that surgical interference will effectually drain the pancreas and prevent the fatal attack, which is so characteristic of most of the severe cases.

In our first series of sixteen consecutive cases in which we operated up to June, 1915, we had a mortality of 62.5 per cent.

In our second series of fifteen cases since June, 1915, the diagnosis having been made in 75 per cent. of the cases, there was a mortality of 13.6 per cent.

There were two cases in which we did not operate, as the patients were in a moribund condition when admitted and promptly died.

Our mortality statistics show the importance of prompt diagnosis and the timeliness of operative procedures.

OPERATIVE TREATMENT

Operation is indicated in all cases, unless shock is extreme, and very rapid operation is of extreme importance. The condition of the patient will determine when any gallbladder operation otherwise indicated should be done.

The pancreas may be exposed by any one of four routes: (1) through the gastrohepatic omentum (which is preferable); (2) through the transverse mesocolon; (3) through the gastrocolic omentum, and (4) in the late stages, when pointing, through the lumbar region.

Operation consists of multiple punctures of the pancreas with blunt forceps and drainage of the gland with rubber tissue and gauze, as if it were an acute phlegmon. The omentum is closed around the tube.

POSTOPERATIVE TREATMENT

The postoperative course consists of a strict antidiabetic diet and sodium bicarbonate to reduce the pancreatic secretion. We would strongly advise keeping the patient under supervision for several years owing to the possibility of recurrences of acute attacks and the development of cyst formation or chronic pancreatitis.

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ABSTRACT OF DISCUSSION

Dr. John B. Deaver, Philadelphia: This is an important paper, read at an important time, when medical men are treating diseases of the gallbladder and holding the patients until the infection has too often gone beyond the gallbladder. This paper should be a warning to medical men. I am sorry this audience is not one of medical men as well as of surgeons. We will in time influence the medical men to be more radical.

Dr. Linder has brought out the fact that the gallbladder holds an important place in diseases of the pancreas. I believe that the most common cause of acute pancreatitis is retro-injection of bile through the duct of Wirsung. I also believe that the duodenal contents are responsible for a percentage of cases of acute pancreatitis. Furthermore, we must consider hematogenous infection. I have seen two cases of circumscribed abscess of the pancreas due to infection of the lower abdomen. The onset of the pancreatic infection was sudden and acute, the patient doing well after the abdominal trouble, when he was suddenly seized with acute pain referable to the epigastrium, with consequent symptoms of pancreatic involvement. I believe gallbladder infection is a common cause of disease of the pancreas. In my experience I meet with four varieties of pancreatitis, the ultra-acute, the acute, the subacute and the chronic. The ultra-acute are those in which the patients usually die. I have seen these patients die while being transported to the operating table, and they die because of the extensive hemorrhage and the liberation of the pancreatic ferments, causing profound

toxemia. The acute cases are amenable to surgical treatment if taken promptly.

I agree with all Dr. Linder has said, with the exception of his remarks on lavage; I do think lavage accomplishes something in acute pancreatitis in the way of temporary relief, but very little in comparison with what it accomplishes in vomiting from other causes.

DR. ERNEST LAPLACE, Philadelphia: In every case of pancreatitis we should know specifically, if possible, whether the infection reaches the pancreas through the blood, the bile or the lymphatics. The nature of the micro-organisms determines the clinical symptoms; hence, there will be various clinical pictures of pancreatitis, as there are of appendicitis. Much difficulty, however, may result in the diagnosis when the condition has produced a mixed infection. The most severe cases are due to streptococcus infection. Hemorrhagic pancreatitis with great effusion of so-called froth and gangrene may result. The pancreas has no capsule and hence great congestion of the pancreas would be followed by an exudation of a secretion which may spread to the whole abdominal cavity and create irritation and partial digestion of the structure. We have met this condition several times, resulting in great thickening of a large area of the intestinal tract, and also resulting in gangrene of the intestine. Drainage of the abdominal cavity should be resorted to as the main therapeutic procedure. Ileus paralyticus may result, simulating intestinal obstruction. Our only hope should be very early interference for the purpose of draining the abdomen, even at the risk of operating before the precise diagnosis is made.

DR. WILLIAM LINDER, Brooklyn: I agree with Dr. Deaver that one gastric lavage will not be sufficient in patients who have developed a toxic ileus. But in patients seen early, there is not much recurrent vomiting. The diagnosis and prognosis will improve with greater experience. In our first series of sixteen patients operated on before June, 1915, we had a mortality of 62.5 per cent. The second series of fifteen patients operated on subsequent to that date gave a mortality of only 13.3 per cent. In all acute abdominal conditions one must think of the possibility of acute pancreatitis. I take issue with Dr. Laplace who says that acute pancreatitis is necessarily a bacterial infection. It is a chemically induced inflammation, and bacteria only secondarily produce suppuration and gangrene. The chemical irritant, which as a rule is dammed-back bile, produces hemorrhage. This destruction of the pancreas liberates trypsin and lipase, which ferments, by their activation, lead to a peculiar toxemia and fat necrosis.

Hookworm and the Soldier.—Stiles (*Public Heath Reports*, Aug. 17, 1917) directs attention to the possibilities of hookworm infection as affecting the troops now being recruited and trained. He says that in a newly formed military unit recently mobilized a soldier was about to be disciplined by his commanding officer for shirking his duties, the soldier claiming that he was not well. Stiles was asked to examine and pass an opinion on the man's condition. The diagnosis of hookworm infection was made on the symptoms and it was confirmed microscopically. After treatment the soldier promptly gained 8 pounds. In the cases of ten other soldiers a tentative diagnosis of hookworm disease was made on the symptoms. In a total of 75 military recruits recently examined by Stiles at a government reservation, 47 (63 per cent.) had hookworm infection, 3 *Ascaris lumbricoides*, 1 *Hymenolepis nana*, and 1 a heavy infection with *Strongyloides;* 2 had double infections; 25 examinations were negative. The man with the *Strongyloides* infection was recommended for discharge from the service on the ground that no satisfactory treatment is known for this condition. An ex-cadet from West Point failed by a narrow margin in his midyear examination, and theoretically, Stiles says, his hookworm infection was sufficient to account for his failure and the financial loss in his training sustained by the government. Stiles says examination of recruits for parasites, particularly *Strongyloides*, should not be omitted, and calls attention to the dangers and possible loss on this account.

Special Article

MODE OF INFECTION, MEANS OF PREVENTION AND SPECIFIC TREATMENT OF EPIDEMIC MENINGITIS *

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NUMBER, DURATION AND TREATMENT OF CARRIERS

(*Continued from page 645*)

Treatment.—Carriers of the meningococcus are now recognized as the sole source of infection in epidemic meningitis. The carriers may, moreover, consist of persons who have not had meningitis, or be persons suffering or convalescent from the disease. We have seen that, left alone, the meningococcus tends of itself to disappear from carriers; the question has arisen whether the clearing up process can be artificially hastened.

The means employed to promote the disappearance are essentialy two: First, artificial immunization of the carriers through inoculation of killed cultures of the meningococcus. It has failed completely. Next, the application of antiseptic chemicals to the nasopharynx by swabbing, douching, spraying and vaporization. With certain of these methods a considerable degree of success has been achieved.

The list of chemicals employed includes potassium permanganate, chlorin water, formalin, iodin, zinc sulphate, and the chloramins. The limitations surrounding local disinfection are imposed by the anatomic conditions which make it difficult or even impracticable to bring all parts of the nasopharyngeal mucosa under contact influence of disinfectants applied by swabs and douches. And yet in some instances, application in this way has been followed by prompt disappearance of the meningococcus. The case is somewhat different with sprays and vapors. Both are or may be inhaled and hence drawn over the entire exposed respiratory mucous membrane. In this process the vapor condenses and is deposited on the membrane, and a similar deposition follows the spraying. The vapor method of applying chloramin and zinc sulphate has been developed by Gordon and Flack,[9] whose publication should be consulted for details of apparatus and procedure. Their results will be summarized here. In passing, it should be said that they state that when the carriers are not too heavily infected, the clearing up was distinctly accelerated by causing them to sniff up a 1 per cent. solution of chloramin through the nose, expelling it through the mouth. This exercise is to be carried out twice a day and combined with permanganate (0.1 per cent.) gargling.

The disinfectants employed for vaporization were chloramin-T, 2 per cent., and zinc sulphate, 1.2 per cent., in watery solution. One liter of the solution is steam-sprayed into a room of 750 cu. ft. capacity in the course of from fifteen to twenty minutes, during which time the carrier remains there inhaling through

* From the Laboratories of the Rockefeller Institute for Medical Research.

* As the subject matter of this article is of timely importance, the reprints have been prepared in advance of the publication in THE JOURNAL, and can be had by sending a stamped, self-addressed envelope to this office or to the author.

9. Gordon, M. H., and Flack, M.: English Report, p. 77.

the nostrils. A single inhalation is given per day. Chronic carriers, that had previously been under observation from three weeks to seventeen weeks, became permanently clear of meningococcus after inhalations of chloramin varying in number from ten to four. The disappearance, in the majority of instances, took place on the ninth or tenth day. The fewer the number of meningococci present, the more quickly, as a rule, were they suppressed. But even when practically pure cultures were being obtained from the swab, suppression took from seven to ten days. Among fourteen carriers treated in this way, three failed to clear up. The zinc sulphate vapor was more effective in lightly than in heavily contaminated carriers. The former became free in from two to eight days, the latter requiring from eighteen to forty-two days.

The very distinctly encouraging results thus achieved are offset somewhat by the difficulties surrounding the method of applying the sprays. With a view of obviating them and making the application of chloramin in an enduringly active form a simple procedure, Dunham and Dakin[10] have devised and recommended a solution of dichloramin-T in oil applied by means of a hand spray designed for paraffin oil. With such a spray, it has been found possible to render the nasopharynx sterile for aerobic bacteria in a few hours. Subsequently, bacteria reappear, of course, from the dust, etc. Thus far, only a small number of tests on carriers of the meningococcus has been made, but the results are promising. The method of procedure is given below.

1. The nose is cleared with salt solution or with 0.25 per cent. aqueous chloramin-T solution either by spraying or irrigation. The nose should be blown into a handkerchief between applications; and the chloramin-T solution should be used thoroughly as a gargle.

2. When the increased flow of secretion from the nose has subsided, the oil solution of dichloramin-T is applied with an oil atomizer. The oil spray should be repeated at intervals so as to make at least four treatments daily about equally spaced from each other. The spraying should be thorough and the oil carried to all parts of the membrane accessible. The first few applications of the oil sometimes occasion sneezing, but tolerance is soon acquired and subsequent applications cause no inconvenience.

3. The preparation of the dichloramin-T oil embraces three steps. First the solvent eucalyptol (United States Pharmacopeia) is chlorinated. Five hundred c.c. are treated with 15 gm. of potassium chlorate and 50 c.c. of concentrated hydrochloric acid for twelve hours or longer, and then well washed with water and with sodium carbonate solution. The water is drawn off and 15 gm. of dry sodium carbonate are added to the oil and the whole is allowed to stand for twenty-four hours. The oil is filtered off, and dried with a little solid calcium chlorid, when it is ready for use.

Second, the paraffin oil is chlorinated. To 500 c.c. of commercial paraffin oil, 15 gm. of potassium chlorate and 50 c.c. of concentrated hydrochloric acid are added and the mixture is exposed to light, preferably sunlight, for several hours. It is then transferred to a separating funnel and washed successively with water, a solution of sodium carbonate, and again with water. The opalescent oil is drawn off, solid calcium chlorid added, in small quantity, and about 5 gm. of animal charcoal. On subsequently filtering through paper, a yellowish oil ready for use is obtained.

The third step is the preparation of the oil solution of dichloramin-T for use in the spray. Two-tenths gm. of the dichloramin-T is dissolved in 2 c.c. of the chlorinated eucalyptol without heating. When the solution is complete, 8 c.c. of the chlorinated paraffin oil are added. After mixing, the solution is ready for use. The solution contains 2 per cent. of dichloramin-T. It is relatively unstable, and should be discarded as soon as a distinct precipitate makes its appearance. An opalescence or moderate cloudiness is not evidence of material deterioration. It is a safe rule not to use the completed solution for more than three or four days after its preparation. It should be protected from strong light and is best kept in a cool place. Where large quantities are needed, a stock 10 per cent. solution of dichloramin-T in eucalyptol may be prepared and kept on hand in a cool, dark place for dilution with the paraffin oil, as 1:4, as required. The eucalyptol solution will suffer little deterioration in a month.

Summary.—This would seem to be the proper time and place to bring together and present the essential practical points regarding meningococcus carriers in military establishments. The carrying out of bacteriologic measures for the detection of the carriers on a large scale will permit the release of 70 per cent. or more of the persons swabbed on the basis of a single examination and within a period of forty-eight hours. A second group will also be released after agglutination tests have been made with suspicious micrococci, which will take another day. But where positive carriers have been detected, they should be detained and not permitted to return to their quarters or mingle with their units until subsequent bacteriologic examinations determine them to have become free. These examinations should be two in number and made at intervals of from four to six days, and the release should follow on two successive negative findings. In the case of convalescents, at least two negative cultures, taken at four to six day intervals, should be required before their discharge from hospital is permitted. In the rare instances of long persistence of the meningococcus, such as occur among true chronic carriers, special rulings will need to be made. It is to be hoped that with the perfection of means of chemical disinfection, the whole process of clearing up can be greatly accelerated.

There can be no doubt that, as compared with general indiscriminate quarantine of men in quarters following cases of epidemic meningitis, the detention based on bacteriologic examination not only affords far more protection, but is saving in time, so that in practice the quarantine period is actually shortened.

Finally, the question may be put whether the evidence is conclusive that carrier infection takes place and is frequent. There are two ways in which this question can be answered: First, by quoting incidence rates under camp conditions in which carriers have been sought, found and removed, and where this has not been attempted. While examples are not numerous, the rates are smaller under the former circumstances. Second, by following the cases of epidemic meningitis which arise in the course of the movements

10. Dunham, E. K., and Dakin, H. D.: Brit. Med. Jour., 1917, **1**, 682.

of the carrier. This has now been done with soldiers going home on leave, sometimes only for a few days, and who, having infected wife, children, mother or other relatives, return to camp to be discovered to be carriers of the meningococcus.[11]

BACTERIOLOGIC DIAGNOSIS

Inflammation of the cerebrospinal meninges, or meningitis, is attended by changes in the cerebrospinal fluid which frequently become obvious to the naked eye. A turbid fluid is taken to denote inflammation and, when epidemic meningitis is suspected, to be presumptive evidence of the existence of that disease. But the conclusive indication of the nature of the condition is supplied by the demonstration by the microscope or in cultures of the meningococcus itself.

The meningococcus was designated by its discoverer, *Diplococcus intracellularis-meningitidis*, because of its affinity for the protoplasm of the polynuclear leukocytes present in the inflamed meninges. This name is now little employed because of its inconvenience; but it is also something of a misnomer because the meningococcus not infrequently is present outside the leukocytes in the surrounding fluid. The common experience is to find the micro-organism partly inside, partly outside the cells; but in some instances they are practically all inside, in others practically all outside of the leukocytes.

The criteria at present acceptable as determining the bacteriologic diagnosis of epidemic meningitis are somewhat modified by the experience gained in the last years through frequent lumbar puncture and in connection with the serum treatment.

Common experience has shown that the quality of the cerebrospinal fluid is not decisive, for while the fluid is usually turbid in epidemic meningitis and tends to be clear in tuberculous meningitis, lumbar puncture performed early in the course of the former infection may yield an almost perfectly limpid liquid.

Similar experience has proved also that disparity may exist between the meningococcus occurring in the cerebrospinal fluid and the results of the cultures when the medium is in all respects favorable. At times the micro-organism is found in characteristic form, staining property and position within leukocytes, and yet the cultures remain negative; at other times they are not detected in the microscopic preparation, and yet growth is obtained in the tubes.

Explanation of this disparity presents no especial difficulty. The meningococcus is an acknowledged fragile micro-organism, and is doubtless at times already injured or dead when observed under the microscope; the quantity of the cerebrospinal fluid brought under inspection with the microscope is minimal in comparison with the amount transferred to the cultures. It is not, therefore, surprising that the meningococcus may be missed in the one place and yet come into view in the other.

But the important question which presses relates to the criteria which suffice to establish a given case as being one of epidemic meningitis. It is obvious that if the characteristic micrococcus appears under the microscope or develops in cultures, no doubt need be entertained. Yet, it is desirable although not essential to subject the culture to an agglutination test with the polyvalent serum to exclude all possibility of error, since in rare instances, meningitis is caused or attended by gram-negative micrococci[12] distinct from the meningococcus. When the case is one which has proved refractory to treatment with a reliable antimeningococcic serum it is still more desirable to perform the agglutination test.

The attitude to assume toward such a given case in which the fluid removed by lumbar puncture is clear, in which meningococcus has not been detected in the centrifuged sediment, and in which cultures are not obtainable, is more difficult to define. And yet it is just this kind of case which becomes immeasurably important with reference both to specific treatment and to prophylaxis. Indeed, acute observation will discover a number of such cases which can be arrested by a timely injection of antimeningococcic serum.

The solution of the diagnostic puzzle is furnished by the presence of the meningococcus in the nasopharynx. In certain instances the symptoms of illness are attended by meningism; other slight signs referable to the nervous system will arise in detained carriers; such persons come at once under grave suspicion and should be treated with the serum without delay. In other instances, the detection of the meningococcus in the nasopharynx, after the symptoms have appeared for the first time, points to the probable nature of the malady. Here also the therapeutic indication would appear to be clear. The procedure outlined is not based on theoretic considerations alone, but on actual experience in which the subsequent events, by making possible the demonstration of the meningococcus in the cerebrospinal fluid of such doubtful cases, proved the correctness of the deduction.

Moreover, the agglutination test has added to the conclusiveness of the diagnosis in the class of case just described. In several instances reported in which the meningococcus could not be grown from the cerebrospinal fluid, but was grown from the nasopharynx, the blood of the patient agglutinated the same type of meningococcus as was found in the nasopharynx, but not other types of the micro-organism.

Finally, all cases definitely diagnosed epidemic meningitis on the basis of bacteriologic examination of the cerebrospinal fluid will yield the meningococcus on proper and prompt examination by cultures of the nasopharynx. It is desirable, therefore, always to swab the nasopharynx at the same time that the lumbar puncture is performed. Even in instances in which the cerebrospinal fluid is turbid, the meningococcus may sometimes escape detection; hence its discoverey in the nasopharynx is particularly significant and helpful.

The cerebrospinal fluid is cultured in the sheep serum medium or other suitable medium described. The usual procedure is to plant from 1 to 2 c.c. on the surface of a slanted tube. When facilities are at hand, centrifuged sediment may also be used to spread over the slanted medium. The tubes are at once incubated at 37 C. for from twenty to twenty-four hours. If negative, the fluid may be made to run over the surface again and the tubes incubated for another twenty-four hours. Under circumstances in which very few or no micrococci have been detected in the fluid, a left over portion may be incubated at 37 C. over night and then examined microscopically and planted on the slanted medium. In this manner, negative may be turned into positive results; but especial

11. Flack, M.: English Report, p. 58.

12. Micrococcus crassus, flavus and catarrhalis and the gonococcus have been isolated from the cerebrospinal fluid.

care is required to avoid error through the accidental growth of contaminating micrococci.

SERUM TREATMENT

Preserum Mortality.—The discovery of the bacterial cause of epidemic meningitis and the perfection of lumbar puncture have made it possible to establish accurately the degree of its fatality. The earlier mortality estimates are less trustworthy, since they obviously could not have rested on such certain evidence of the nature of the disease. The recent pandemic afforded, therefore, the first opportunity to determine the actual mortality of epidemic meningitis, as it affected countries and peoples of various nationalities and widely different social custom. Accurate knowledge of the mortality becomes imperative once we undertake to determine the value of the serum treatment.[13]

In the period of 1904-1909, epidemic meningitis prevailed over a wide territory in the United States and Canada, and after an intermission reappeared in the winters of 1911-1913 in the southwestern states, since which time it has prevailed fitfully and sporadically. The representative fatalities recorded in the preserum period are: Greater New York, 73 per cent.; Boston, 69 per cent.; Hartford, 76 per cent.; several cities in Ohio, from 70 to 90 per cent.; Porterville, Calif., 90 per cent.; among 1,500 cases occurring in Texas and Louisiana, 75 per cent. During this period the mortalities in great Britain were: Leith, 74.7 per cent.; Edinburgh, 80 per cent.; Glasgow, 74.8 per cent.; Belfast, 70 per cent. In Germany they were: Breslau, 62.3 per cent.; Brieg, 42.5 per cent. Flatten collected 3,085 cases of this period which gave a mortality of 67 per cent. The mortality in France was placed at 75 per cent., in Belgium, 77.7 per cent., and in Italy, 55.6 per cent. The figures for Asia and Africa are: Palestine, above 80 per cent.; Transvaal, 74 per cent. What is striking in these figures is the little variation in the mortality as the disease attacked the mining districts of Northern Germany or the Transvaal, the industrial population of Ireland and Scotland, the city population of France, the military garrisons of Belgium, and the urban population of the eastern or the suburban population of the southwestern United States. There is, however, one distinction that should be drawn: such few accurate data as are available tend to indicate that the sporadic cases, as diagnosed bacteriologically, are somewhat less fatal than cases arising during an epidemic wave.

Mortality Under Serum Treatment.—The antimeningococcic serum began to be employed in 1906-1907, first locally, and then later more generally. Thus it failed to be used in certain places before the epidemic wave had passed, and in other places, its employment was begun at the middle or height of the epidemic, according to circumstances. Recently it has been administered in many and withheld in some cases occurring in the military garrisons of Great Britain and the other European countries at war. Hence records have sometimes been available to serve as checks or controls over the figures derived from the serum-treated cases. The latter figures do not differ essentially from those stated above for the preserum period.

The antimeningococcic serum prepared at The Rockefeller Institute has been employed at home and in several foreign countries to which it was sent. In 1,294 instances, the records of the cases, which were returned, were complete enough to permit an analysis to be made. Of the number, 894 patients recovered and 400 died, giving therefore a gross mortality of 30.9 per cent.

The larger number, or 1,211, of records were so detailed that it was found possible to analyze them according to the period of the disease at which the serum injection was begun (Table 1).

TABLE 1.—ANALYSIS OF RECORDS OF MORTALITY UNDER SERUM TREATMENT

Serum Injected	No. of Cases	Recovered	Died	Recovered Per Cent.	Died Per Cent.
From first to third day....	199	163	36	81.9	18.1
From fourth to seventh day.	346	252	94	72.8	27.2
Later than seventh day....	666	423	243	63.5	36.5
	1,211	838	373	69.2	30.8

These results, which are in striking contrast to those given for the period immediately preceding the employment of the serum, should be compared with the tables of mortality constructed in a similar manner by others who had large experience with the serum treatment. Thus in France, Dopter[14] has analyzed 402 and Netter[15] 100 cases. In Germany, Levy[16] has analyzed 165 cases; in Greece, Christomanos has analyzed 186 cases, and recently Flack[17] in England has analyzed forty-three cases occurring among the military forces in the London district.

TABLE 2.—COMPARATIVE MORTALITY REPORTED BY VARIOUS OBSERVERS

Treatment began	Flexner Per Cent.	Netter Per Cent.	Dopter Per Cent.	Christomanos Per Cent.	Levy Per Cent.	Flack Per Cent.
Before third day	18.1	7.1	8.2	13.0	13.2	9.09
From fourth to seventh day	27.2	11.1	14.4	25.9	20.4	....
After seventh day	36.5	23.5	24.1	47.0	28.6	50

The accompanying tabulations illustrate the influence exerted on the mortality, and they are supported by quite large numbers of cases observed during 1911, 1912 and 1913 in Texas and Louisiana and abroad. Thus in Texas the total cases reported from cities and countries, exclusive of the city of Dallas, were 1,956. Of them, 562 received no serum: the mortality was 77 per cent.; 1,394 were given one or more injections of the serum: the mortality was 37 per cent. Three cities in Texas gave the following results: Galveston, eighty-three cases treated with serum: mortality, 24 per cent.; Houston, 169 cases treated with serum: mortality, 27 per cent.; Dallas, 624 cases treated with serum: mortality, 26 per cent. The epidemic in Shreveport, La., embraced seventy-four cases not treated with serum, with a mortality of 85 per cent., and 176 cases treated with serum, with a mortality of 30.1 per cent. During this period, Levy in Germany studied an epidemic of which the mortality in cases treated without serum is given at 52.14 per cent., and of 165 cases treated with serum, as 18.18 per cent.

The serum-treated cases are all comparable with each other except in the single instance of those reported by Flack. For while the others represented the prevalence of epidemic meningitis among the gen-

13. Much of the matter which follows here is taken from Flexner, Simon, Jour. Exper. Med., 1913, **17**, 553.

14. Dopter, C.: Ann. de l'Inst. Pasteur, 1910, **24**, 96.
15. Netter, A., and Debré, R.: Le méningite cérébro-spinale, Paris, 1911.
16. Levy, E.: Klin. Jahrb., 1911, **25**, 121.
17. Flack, M.: English Report, p. 45.

eral population, Flack's cases consisted exclusively of adults of the military personnel.

Other Local Methods of Treatment.—The serum treatment has not made its way without opposition and more or less fluctuation of favor. It is very desirable that this fact be emphasized, because the same circumstances which have for a time carried the treatment backward in the past may operate again and suffice to do so in the future—and this notwithstanding the favorable figures given above.

To succeed with the serum, first a potent product must be available; second, it must be applied promptly and in a systematic manner. The chief obstacle to success with the serum has been imperfectly prepared, and hence impotent samples of the serum. The only way to avoid that particular misfortune is for the federal government to establish and enforce standardization. The disappointments and calamities of the English experiences early in the war, fortunately retrieved afterward when potent serum became available, arose from worthless commercial products.

Prior to the introduction of serum therapy, two methods of local treatment had been used.

(*a*) Frequent evacuation of the cerebrospinal fluid by means of repeated lumbar punctures. The effects following the procedure have been widely discussed, and seem to consist mainly in the relief of pressure, which is often very grateful to the patient. The termination of the disease has not been essentially affected. This is also the view of Netter, Goeppert and others who studied the epidemic at its height during 1904-1910. Indeed, it was during the period of high mortality that the method was chiefly employed in routine treatment. With the failure due to impotent serum, in England in 1915 repeated lumbar puncture was again resorted to. It was strongly recommended in some quarters,[18] and all the benefits desired from the serum were even attributed to its effects.

(*b*) The injection of chemicals such as lysol and protargol into the meninges. There are experimental reasons for believing that the introduction of chemical antiseptics into the subarachnoid space is capable of doing distinct harm.[19]

(*To be continued*)

18. Foster, M., and Gaskell, J. F.: Cerebrospinal Fever, Cambridge, 1916.
19. Flexner, Simon, and Amoss, H. L.: Jour. Exper. Med., 1915, **23**, 683.

Accident Prevention and Welfare Work in a Large Industrial Plant.—The *General Electric Review* describes the organization and work of the medical department of the Schenectady plant of the General Electric Company which was inaugurated in 1907. Complete records have been kept since that time. In the first half of this period there were twelve fatal accidents, an average of 2.4 per year. In the last half, that is, up to and including 1916, the fatalities decreased to an average of 2 per year, while in the last five years the number of employees has increased 25 per cent. From 1907 to 1911 one man out of 6,100 met with a fatal accident, while in the last five years only 1 in 9,000 occurred. In 1916 the fatalities were 1 in 10,000. In the latter year 13,716 examinations were made. Every employee in every department is accepted only through the medical department. An accident in the Schenectady works means every case of injury even though only a scratch, and must have the attention of the medical department to prevent infection. In 1916 there were 13,190 accidents of all degrees of severity, but only 36 were bed cases and only 11 serious enough to require an ambulance call. Out of 21,000 men working with steam, electricity and machinery of all kinds only two were killed.

Military Medicine and Surgery

TRENCH FEVER

PRELIMINARY REPORT

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During the past few months it has been my good fortune to observe several hundred cases of this extremely prevalent, carefully studied, but yet undetermined infection, known as trench fever. The name is really a misnomer. At first it was considered a result of trench life, and traumatic periostitis of the tibiae was thought to be the underlying pathologic process. Today we know that it develops in troops that have not experienced trench work; indeed, it develops sporadically in individuals who have only occasionally visited training camps and convalescent hospitals.

This so-called trench fever is a distinct clinical entity, and may be defined as an acute infectious disease of unknown etiology and self-limited course, characterized clinically by cyclic febrile attacks, intense headache and backache, and pains over the tibiae which are particularly severe at night.

Etiology.—The specific cause has not been determined. Diplococci have occasionally been found in blood cultures; a spirochete has also been described, but neither is constant. The possibility that lice act as the intermediate host is not remote. One attack does not produce immunity.

Symptoms.—After a short incubation, during which period the patient may complain of slight indisposition, the disease is ushered in with a sharp rise of temperature to from 101 to 104 F., which may be preceded by chilly sensations, rarely by a true rigor and occasionally by vomiting, and is followed by headache, usually frontal, intense backache, and continuous and often excruciating pain over the tibia, with nocturnal exacerbations.

The fever is quite characteristic in the individual case. After a sudden rise the temperature reaches normal in the majority of cases in from twenty-four to ninety-six hours. An afebrile period lasting from one to several days, sometimes a week, follows, and this in turn is followed by another febrile exacerbation. This cycle is repeated a number of times, but it has been my experience that in a large percentage of cases the temperature is inclined to remain normal after the third rise. As in other acute febrile diseases, I have met abortive cases in which the temperature reaches normal quickly after the initial rise, and does not again become elevated; also cases with more or less continuous fever, with slight remissions, closely resembling typhoid.

Shin Pains.—Of all symptoms of the disease, the shin pains are the most characteristic. They appear early, are constant, extremely distressing, particularly at night, do not yield to therapy, and often persist for months after all other evidences of the disease have disappeared.

Blood.—As I have stated above, no specific organism has been isolated. Lieut. Marcus Neal, our pathologist, has occasionally been able to grow, by blood

culture, a diplococcus, but not sufficiently often to justify definite conclusions. He has not observed the spirochete described by some British writers. The blood picture, however, is fairly characteristic. During the febrile stage the leukocyte count reaches from 14,000 to 16,000 and drops to about 10,000 in the afebrile period. The large mononuclear lymphocytes are increased to from 15 to 25 per cent., and the polymorphonuclears are proportionately reduced.

Genito-Urinary Tract.—The urinary findings during the febrile stage resemble those found in other acute infections, namely, decreased amount, high specific gravity, frequently albumin, and in severe cases hyaline and coarsely granular casts and red blood cells. With the drop in temperature, there is polyuria. The casts frequently persist long after the albumin has disappeared. True nephritis has not been frequent in my experience.

Other Symptoms.—Sweating occasionally occurs, and herpes urticaria and roseolae are rare. The sensorium is practically always clear. I have never witnessed delirium. Insomnia is common, but is due to the shin pains.

Diagnosis.—The diagnosis is made by recognizing the cardinal symptoms, namely, the typical fever curve, the shin pains, and the increase of the large mononuclear lymphocytes in the blood. Physical examination reveals marked tenderness over the tibiae, with rarely edema of the overlying skin. The spleen is not enlarged, but palpation over the splenic area elicits marked tenderness. Heart, lungs, joints, glands and reflexes reveal no abnormality.

When we consider the prevalence of this disease among the hardened and acclimated troops of our allies, it is fair to presume that our own men will be highly susceptible, unaccustomed as they will be to the work to which they will be subjected, to climate totally unlike that which they have previously experienced, and to sanitary conditions sometimes far from ideal.

THE PREVENTION OF SO-CALLED "SHELL SHOCK"

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"Shell shock" includes such a large proportion of the casualties in trench warfare that the advantage that would accrue from its prevention, if possible, needs no argument. It has been said that it causes the greatest percentage of disabling "casualties" outside of wounds. The exact number of cases probably has never been determined, for the question becomes largely one of diagnosis and classification. The personal equation of the surgeon who makes the diagnosis is a large factor. The neurasthenic type, for instance, is often classified as general exhaustion and breakdown instead of being ascribed to its true cause, shell shock. The plan which I propose for its prevention is based (1) on quite extensive personal studies of cases made at the front and in the base hospitals in France and England, where I became familiar with the disease as it occurs in the present war, and (2) on my general knowledge of traumatic neurosis obtained through many years of professional study and practice.

NATURE OF THE DISEASE

It is now the consensus of opinion that true shell shock, as distinguished from pseudo shell shock, differs in no way from the ordinary traumatic neurosis as observed after railway and other accidents, earthquakes, etc. Trench warfare seems, however, to have developed certain types which are more frequent than in the accidents of civil life, although they also occur there.

Being a traumatic neurosis, it is accordingly nothing but traumatic hysteria. Types vary all the way from neurasthenia to profound paralyses and anesthesias.

Among the cases erroneously classified as shell shock are undoubtedly many of an organic nature, due to actual injuries of the brain and spinal cord resulting from the soldier being violently thrown against some object, or from some other physical trauma. Some perhaps are due to gas poisoning, and it is possible that some may be due to the sudden compression and rarefication of the air. This, however, has not yet been proved. All such cases should be classified as pseudo shell shock. Much misunderstanding has arisen from confusing them with the hysterical type which undoubtedly comprises the vast majority of cases.

CAUSATION

Causation, from the point of view of prevention, is of the utmost importance. The causative factor is unquestionably psychic, that is, fear acting in a mind already prepared by environmental influences for the final results. This preparedness of the mind to be influenced functionally under certain traumatic conditions, as a mental factor cooperating with the exciting fear factor, is also found in the civil cases. Thus, it has been found that in railroad accidents very few of the employees (generally given as 0.5 per cent.) suffer from traumatic neurosis, while a very large proportion of the passengers exposed do so suffer. Likewise, I believe that traumatic neurosis is rarely observed on board battleships following the explosion of shells, although it is obvious that the traumatic conditions are similar to those obtaining in trench warfare.

Shell shock should be more properly described as "shell fear" or "shell funk."

The theory on which any method of prevention must be based is that there exists among soldiers an anticipatory fear of what will happen when exposed to the explosion of shells, even when they are not physically hit or injured. Anticipatory fear has been created by the environment, that is, by the common belief of their comrades, the attitude of mind, point of view, etc., shared by those with whom the soldiers come in contact, which would include the medical officers as well as the military officers. It has been reported to me, although not directly from one in authority, that cases have occurred in men before they reached the trenches and before they had been under fire, and that these cases were due to anticipatory fear.

The present general belief among soldiers is that shell shock is due to physical injury of the brain, that from the mere concussion of the air produced by a high explosive shell they are likely to be seriously injured in mind and body (loss of memory, dumbness, paralysis, etc.), and furthermore, that when this hysterical state has been produced, they are more or less permanently incapacitated.

In other words, the soldiers' idea is much like that which used to prevail regarding the pathology of

"railway brain," "railway spine," etc., under the dominance of the concussion theory of Ericson.

Even veterans acclimated to shell fire succumb to the fear of being buried alive and so injured. Here we have what is practically "earthquake shock." Many soldiers are consequently in a state of continuous terror during the course of a bombardment by the enemy.

That "fear shock" can be entirely prevented is chimerical; that a large percentage could be prevented is within the bounds of possibility and the attempt is worth trying, especially as it would not require any elaborate organization beyond what already exists.

PLAN FOR PREVENTION

The principle on which any plan is based must be the education of the soldier. This therapeutic education should, however, be based on a preliminary systematic study, by a board of specialists in the psychoneuroses, of (*a*) the mental attitude of soldiers generally toward shell fire and shell shock; (*b*) clinical varieties of this psychoneurosis as it occurs in trench warfare; (*c*) its frequency and disabling incidence, and (*d*) the state of mind previous to the trauma of those suffering from it.

On the basis of the findings of such a study, first, the regimental surgeon through lectures and clinical demonstrations, the cases in the hospitals being used for material, would be instructed systematically in the symptoms and pathology of the disease and the methods of psychotherapy for its prevention. This instruction is essential because, I believe, few medical men who are not clinical neurologists or psychiatrists would venture to claim any competent knowledge of the psychosis. Psychotherapy is an art requiring specialists for instruction. The surgeons after instruction should have acquired a fair degree of skill in the application of the art.

Second, the soldiers, including officers, could then, in units of, say, 100, in turn be instructed in the nature of the disease through lectures by the regimental surgeons. It would thus be fully explained to the soldier that shell shock is a form of hysteria, that it is due to fear and not to physical trauma, that if not actually hit by a shell, and if no physical injury is sustained, there is little danger and nothing need be feared, etc.

The work of instruction should be done in France in the atmosphere of war.

In this way it is to be expected that an anticipatory attitude of mind of healthy preparedness (instead of fear and mystery) would be formed, and also that fear, when a shell exploded in the neighborhood without maiming the soldier, would be so minimized as not to produce the psychoneurosis.

Of course, the plan is experimental, but it would seem to be unintelligent to accept the present situation as final, and that nothing can be done to avert the casualties resulting from fear. To do so is to accept the theory of fatalism which obtained before preventive medicine came to the fore under modern medical science.

Finally, it may be said that this instruction of the regimental and, later, of certain base hospital surgeons (which should also be undertaken) would be of great value to them in the treatment of the disease. The fear of the disease and of being sent back to the trenches is undoubtedly a factor in the prevention of recovery.

I have no idea that this suggestion I am offering will be adopted. It will require the experiences of this war to prepare the official mind to accept the principles of progressive neurologic and psychiatric sanitation, just as it required the horrors of typhoid epidemics in the Boer War and in our Spanish War to bring about the education of the soldier in first principles and the adoption of methodical scientific sanitation against typhoid and other preventable diseases. Every sort of objection probably will be opposed to such a campaign of education, notwithstanding that the education of the soldier (who, after all, is only one of the public) in such matters is only common sense, and reeducation has become the fundamental principle in modern prophylactic medicine, as well as in the cure of functional nervous disorders. Nevertheless, I venture to bring forward this suggestion as a forerunner of the psychiatric sanitation of the future in all armies.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLE HAS BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

W. A. PUCKNER, SECRETARY.

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Determination of sodium hypochlorite.—Dilute 10 Cc. concentrated solution of sodium hypochlorite-Mulford to 250 Cc. Place 50 Cc. (representing 2 Cc. of the original solution) in a 300 Cc. Erlenmeyer flask. Add 20 Cc. of potassium iodide test solution, and 2 Cc. of hydrochloric acid, U. S. P. Titrate immediately with tenth-normal sodium thiosulphate solution. The number of Cc. of thiosulphate solution used multiplied by 0.1865 equals weight of NaOCl in 100 Cc. of the concentrated solution.

Determination of free chlorine.—Place 10 Cc. concentrated solution of sodium hypochlorite-Mulford in an Erlenmeyer flask and dilute with 40 Cc. water. Add 20 Cc. of potassium iodide, test solution. Titrate immediately with tenth-normal sodium thiosulphate solution. The number of Cc. of thiosulphate solution multiplied by 0.0373 equals amount of free chlorine (in terms of NaOCl) in 100 Cc. of the concentrated solution. When freshly prepared the solution may contain about 0.2 per cent. of Cl (in terms of NaOCl). On long standing this figure gradually increases but the solution may be used with satisfactory results provided the amount of free chlorine does not increase beyond 1.0 per cent.

Determination of required boric acid.—Place 20 Cc. concentrated solution of sodium hypochlorite-Mulford in a flask add excess of potassium iodide and decolorize with tenth-normal sodium thiosulphate solution. Add 0.1 Gm. of powdered phenolphthalein and titrate with a 4 per cent. boric acid solution using the first decided decoloration point as the end reaction. From the figure thus obtained, calculate the percentage of boric acid required for the lot in question. This amount is stamped upon the label of the package.

Origin of Lenses.—The first clear and unmistakable statements from which dates modern knowledge of lenses and their action are found in the works of Roger Bacon.—The Microscope:—Simon Henry Gage.

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SATURDAY, SEPTEMBER 1, 1917

THE ETIOLOGY OF SCURVY

Scurvy has long been looked on as a disease due to the lack of adequate quantities of some hypothetic antiscorbutic substance in the diet. In the more recent development of the conception of "deficiency diseases" as disorders associated with a paucity or a complete absence of some essential dietary constituent from the ration, attention has become centered on a possible lack of those unidentified components for which Funk introduced the name "vitamins." The experimental demonstration on both animals and man that beriberi and experimental polyneuritis can be caused by the lack of such a food component and can in turn be relieved or cured by the inclusion of the missing vitamin in the diet paved the way for the extension of the vitamin hypothesis as applied to deficiency diseases. Accordingly scurvy, pellagra, rickets and some rarer manifestations have in turn been explained as the outcome of a lack of some specific chemical substance essential for the metabolism of the subject.

The scientific study of the so-called deficiency diseases has been somewhat hampered by the fact that the phenomena observed in man in the respective cases have not been easy to reproduce experimentally in laboratory animals. In the case of the infectious diseases the bacteriologist is usually able to duplicate many of the symptoms, sufficiently at least to solve problems of etiology and pathogenesis, by animal inoculations. The deficiency diseases have proved to be more difficult of initiation in an experimental way In the case of scurvy, however, the guinea-pig, when fed for a time on peculiar types of food mixtures, has been found to exhibit the characteristic features of the malady. Holst[1] and his co-workers observed that a diet of oats alone or of oats and heated milk or oats and dried cabbage caused scurvy in the guinea-pig, whereas oats and fresh milk or oats and fresh cabbage will adequately nourish this species and maintain the animals in health. It is largely on the basis of these and comparable observations that the theory has been advanced which is current at present regarding the high susceptibility of the antiscorbutic properties of natural foods to deterioration in a variety of ways. Thus it has come to be taught widely that heating and drying are liable to destroy the vitamins supposed to be concerned in the prevention of scurvy; and by that easy extension from fact to assumption, of which the human mind is often so capable, the deteriorating effect of heat on vitamins in general has been widely proclaimed. For this reason, heated milks, heated vegetables and canned goods of all sorts, including fruits, have been alleged to lose the vitamins they possess, as the result of the technical processes to which they have been submitted.

The assumption of a detrimental effect of heat, such as is used in the ordinary cooking procedures, on the stability of the alleged antiscorbutic vitamin is menaced by recent observations of Jackson and Moore[2] in Chicago; for they noted—and this has been confirmed by others—that a large proportion of guinea-pigs kept on a diet of oats cannot be protected against scurvy even when fresh, unheated milk is furnished to them. An important step in advance in unraveling the etiology of scurvy has at length been made by McCollum and his colleagues[3] at the University of Wisconsin. They argued, in formulating a working assumption for their investigations, that all animals as highly developed as the mammals may be expected to require the same chemical complexes in the diet if growth and well being are to be attained. Accordingly, guinea-pigs, the familiar test animals for the experimental production of scurvy, were fed on rations that had repeatedly been demonstrated to be adequate in every way for the rat. Nevertheless, scorbutic manifestations appeared in many cases in the guinea-pigs. For example, the oat kernel can be made suitable as a nutrient for rats if it is supplemented with appropriate protein, inorganic salts and the fat-soluble vitamin found in butterfat. Yet on such a mixture guinea-pigs are very liable to develop scurvy in its severest types. McCollum ingeniously remarks that if the current explanation is correct which makes scurvy the result of a lack of a specific substance, it becomes necessary to make the further assumption that the guinea-pig and man require this specific substance, since both are subject to the disease, whereas other species, including the rat, do not require this hypothetic complex as a dietary component.

Obviously, as McCollum and Pitz[3] point out, there is an alternative explanation. Scurvy may not be a deficiency disease at all in the sense which so many have assumed in the past few years. Without employing any "protective vitamin" in the diet, the Wisconsin investigators have averted scurvy in guinea-pigs,

1. Holst, A., and Frölich, T.: Ztschr. f. Hyg. u. Infektionskr., 1913, **75**, 334.

2. Jackson, L., and Moore, J. J.: Jour. Infec. Dis., 1915, **19**, 478.

3. McCollum, E. V., and Pitz, W.: The "Vitamine" Hypothesis and Deficiency Diseases: A Study of Experimental Scurvy, Jour. Biol. Chem., 1917, **31**, 229.

or cured it when once it was manifest, by attempting to remedy a difficulty which scorbutic animals manifest at necropsy. Usually the cecum, which is very large and delicate in guinea-pigs, is found full of putrefying feces, whereas the lower intestine is empty. It was argued, therefore, that the guinea-pig can thrive only on a diet possessing such physical properties as will lead to the formation of bulky, easily eliminable feces. Diets containing succulent vegetables along with grains serve to keep the animals in good health. Diets, such as oats alone or oats with milk, cause injury primarily because they lead to the formation of pasty feces which the animal is unable to remove from its delicate cecum. An impacted cecum, the seat of putrefaction, may permit injury to the cecal wall sufficient to permit the invasion of the tissues by bacteria; or the animals may be injured by the absorption of toxic products of bacterial origin which possess the property of destroying the walls of the capillaries in those regions in which hemorrhage is characteristically observed in scorbutus. Infection, which has been described as a feature of experimental scurvy, would thus be secondary to development of hemorrhagic areas.

As a matter of fact, by preventing debility of the digestive tract through stretching and contact with irritating and toxic putrefactive products of bacterial origin, McCollum and Pitz have averted and cured scurvy in guinea-pigs. This was accomplished in a variety of ways. The administration of liquid petrolatum was very effective. The use of the laxative phenolphthalein alone produced remedial results and thus served to exclude the possibility that the diets lacked some specific chemical complex of an antiscorbutic character. Orange juice, which is so widely used as an antiscorbutic in infant feeding, has some protective or curative properties in the experimental scurvy of guinea-pigs. Human scurvy is apparently more readily relieved by orange juice, perhaps, McCollum and Pitz remark, because of the greater disability of the guinea-pig in the possession of so large and delicate a cecum. The action of orange juice is ascribed to its laxative influence rather than to any unique vitamin.

Nothing in what has here been reported negatives the supreme importance of dietary factors of the vitamin type. The contention merely is that scurvy is not in reality a deficiency disease in the sense of being caused by the lack of a specific protective substance. We are reminded by the latest investigators that it is not possible to say with confidence at present that human scurvy has the same origin as has the same syndrome in the guinea-pig. However, the undoubted fact, McCollum and Pitz assert, that some infants develop the disease while taking milk, which forms a wholesome food for others, supports the belief that the etiology of the disease is the same in the two species.

THE SUPRARENALS AND SHOCK

Carefully obtained experimental facts often serve the beneficent purpose, in science, of compelling a reconsideration of debatable theories and, sometimes, a new formulation of working hypotheses. Perhaps this will prove to be the case as the outcome of the recent investigations of Bedford and Jackson[1] at the University and Bellevue Hospital Medical College, New York, on the blood in shock. According to these it appears that increased quantities of epinephrin are thrown into the blood during conditions of low blood pressure and shock. This is quite the reverse of what might be expected from the widely current belief that the suprarenal glands are in a state of fatigue during shock.

Various investigators have, in fact, contended for the view that shock is actually the result of suprarenal deficiency. Bedford has remarked that the reports of diminished amounts of chromaffin substance in the glands of individuals exhibiting a depressed circulation are in complete accord with that explanation of shock which holds that the condition is due to a splanchnic dilatation of the blood vessels in the absence of epinephrin, with a consequent fall in blood pressure. Bedford has found, however, that the apparent outpouring of epinephrin in shock is not merely a hasty discharge and depletion of the suprarenals; but since the quantity of epinephric material in the blood actually increases with the prolongation of the period of low blood pressure and shock, there must be an active secretion from the glands.

Attention has already been directed in these columns to the views championed by Cannon and his co-workers which attribute importance to the suprarenal secretion as a reserve for times of special stress.[2] Years ago Elliott suggested that the chromaffin tissue has the function of compensating for injury of sympathetic fibers, and that after sympathetic impulses fail, their place is taken by the epinephric stimulation of the nerve endings. Bedford[1] interprets his observations in accord with somewhat comparable principles. In shock, he suggests, the suprarenals function as a line of secondary defense against a falling blood pressure. The presence of epinephrin in increasing amounts as shock progresses points, Bedford adds, to an attempt on the part of the circulatory system to redistribute the blood and bring about a peripheral constriction of the arteries wherever possible. In this way the normal pressure may be retained. If this self preservative mechanism is sufficient to offset the unknown factors which are instrumental in causing the fall in pressure, shock does not result fatally.

1. Bedford, E. A., and Jackson, H. C.: The Epinephric Content of the Blood in Conditions of Low Blood Pressure and "Shock," Proc. Soc. Exper. Biol. and Med., 1916, **13**, 85-87. Bedford, E. A.: The Epinephric Content of the Blood in Conditions of Low Blood Pressure and Shock, Am. Jour. Physiol., 1917, **43**, 235-257.

2. The Suprarenals and Vasomotor Tonus, editorial, THE JOURNAL A. M. A., March 7, 1914, p. 778; Newer Views of the Functions of the Adrenals, July 25, 1914, p. 322.

Mann[3] has warned against overhasty generalizations associating shock with the endocrine glands. He recalls the recent contention that the discharge of epinephrin from the suprarenals is not indispensable to life or health. It is asserted that even emotional reactions may occur several days after removal of all suprarenal tissue. Mann's tentative statement on the general subject deserves repetition. In all probability, he asserts, some of the endocrine glands, particularly the suprarenals, enter as a factor in the complex condition of shock; but it is quite difficult to determine to what degree they participate as primary active agents in producing the state or how much they are affected by the low blood pressure and the changes incident to the condition itself.

AN INDEX OF THYROID OVERACTIVITY

The human organism manifests a considerable number of phenomena which tend to assume a fairly constant character and form symptoms of ill health when they exhibit deviations from the well recognized normal performance. Uniform temperature and pulse rate under conditions of rest have long been noted as normal features of the bodily functions, and aberrations are daily measured by the clinician as a guide to the character or progress of various types of sickness. Unexpected variations in body weight likewise furnish indications at times of the existence of morbid processes. Last week we called attention to newer modes of measuring that disturbance in acid-base equilibrium which leads to a depletion of the alkali reserve of the organism and is designated as acidosis.[4]

Measurable abnormalities, such as those just cited, are common to numerous diseases. Other symptoms, like nervousness or general lassitude, are often highly significant; but they cannot be expressed in any quantitative or otherwise distinctive manner. It becomes decidedly important, therefore, to find some more accurate and specific indication which will assist in the precise diagnosis, and perhaps the subsequent prognosis, of diseases of the less obvious types. In confirmation of classic studies by Du Bois[5] on this subject, Means and Aub[6] of the Massachusetts General Hospital, Boston, have lately shown in THE JOURNAL that the intensity of intoxication in exophthalmic goiter finds a measure in the rise of the basal metabolism. This is one of the acquisitions to clinical medicine from the modern investigation of human calorimetry so efficiently prosecuted in this country, notably by F. G. Benedict, Graham Lusk, and their collaborators.

The "basal metabolism" or heat production of an individual at the lowest level of metabolism can now be determined with considerable accuracy by indirect calculation from the data of the gaseous exchange. The latter become available through determinations with comparatively simple respiration apparatus, such as many clinics now possess as a part of their scientific equipment. The estimations are made in the post-absorptive condition (fourteen or more hours after food) at complete rest, whereby the stimulus to heat production incident to muscular activity or digestive changes is avoided. As few pathologic conditions that are not easily differentiated from hyperthyroidism show a rise in the basal metabolism, this feature serves as one of the most striking and characteristic manifestations of overactivity of the thyroid. Thus a novel index of the intensity of thyroid intoxication has been added to the hitherto recognized symptoms, including tachycardia, nervousness, loss of weight, and tendency to increased sweating.

Using the measure of the basal metabolism in the way here suggested. Means and Aub[6] have been able to observe the therapeutic efficiency of procedures currently recommended for the amelioration of exophthalmic goiter. Judged by the heat production, rest alone usually causes a marked decrease in toxicity. This may in some cases be supplemented by irradiation with the Roentgen ray. According to the Boston observers, there is a very definite tendency toward recurrence of overactivity after the decrease which commonly follows surgical intervention. They assert that drugs do not materially accelerate the effect of rest. The indications for successful management coincide with the incidental observations of many clinicians, giving added emphasis to the importance of complete rest.

MATERNAL DIET AND MILK PRODUCTION

When a lactating animal is secreting milk, obviously the protein which this fluid contains must be derived, in ultimate analysis, either from the proteins of the diet or from the tissue proteins. This does not mean that food proteins pass directly into the milk; on the contrary, the proteins that are eaten become disintegrated into amino-acids even before they enter the blood stream for distribution in the body. But in the last instance those proteins that are elaborated by the organism depend for their synthesis on a suitable supply of essential amino-acid which must be furnished preformed, whether they come from food or from tissues. If the ration fails to contribute the adequate quota, the body must respond with its own resources; otherwise the supply of milk will fail.

That there is a biologic difference between proteins from various sources has repeatedly been emphasized in THE JOURNAL. Not long ago attention was directed to the interesting work of Hart and Humphrey[1] of the Wisconsin Agricultural Experiment Station show-

3. Mann, F. C.: Shock During General Anesthesia, THE JOURNAL A. M. A., Aug. 4, 1917, pp. 371-374.
4. The Newer Conception of Acidosis, Editorial, THE JOURNAL A. M. A., Aug. 25, 1917, p. 646.
5. Du Bois, E. F.: Metabolism in Exophthalmic Goiter, Arch. Int. Med., June, 1916, p. 915.
6. Means, J. H., and Aub, J. C.: A Study of Exophthalmic Goiter From the Point of View of the Basal Metabolism, THE JOURNAL A. M. A., July 7, 1917, p. 33.

1. Hart, E. B., and Humphrey, G. C.: Jour. Biol. Chem., 1915, **21**; 1916, **26**, 457. The Relation of Proteins to Milk Production, editorial, THE JOURNAL A. M. A., Nov. 4, 1916, p. 1374.

ing that the character of the proteins in the ration, as well as their quantity, has a marked effect on the milk protein production of cows. Comparable experience with nursing mothers has now been reported by Hoobler[2] as the result of observations as similar as possible to those made on dairy cows. Hoobler concludes that the protein in a purely vegetable diet (not including nuts) of the most familiar types is both insufficient and inefficient for the maximum production of milk protein. Vegetarians have introduced nuts very extensively into their special diets in recent years. Hoobler believes that nut protein may be as efficient as animal protein in the elaboration of milk. With this exception, however, he observed that the biologic sources of protein best adapted to milk production are found in animal products; for example, in a mixture of meat, milk and egg protein, with an added quantity of cereal and vegetable protein comprising about one third of the total quantity furnished. Milk protein, in particular, affords the best source for the protection of the maternal tissue and the increase in the mammary secretion.

Never has there been a time when the suggestions that present themselves in the light of the foregoing observations on milk production in woman were more deserving of earnest consideration. The war situation, with the almost inevitable consequence of more or less stringent administration of food supplies, tends to force certain types of nutrients to the front as readily available, and is likely to curtail the use of other long valued foods. Meats will become scarcer, and the supply of milk already is as low as dietary needs and physiologic safety will permit. It will be well, therefore, to bear in mind the specific needs of the pregnant and nursing mothers and to make adequate provision for them at any cost. Furthermore, it is not at all unlikely that the failure of many mothers to supply all the milk that is requisite to promote healthy gains in their young is quite as much a matter of diet as of any other physiologic factor. Hoobler reiterates, what many students of the subject must often have believed, that the "diet of the first three or four weeks of the puerperium is based too much on what might be called sick room specialties, broths, gruels and tidbits of one kind or another which are not sufficient to support an increasing production of milk." The inclusion of at least a certain amount of milk, with its uniquely valuable protein, the salts of lime so much needed in the elaboration of milk and the development of the young, and the presumably indispensable vitamins, is a wise prescription. In general, quoting Hoobler's words, one may state that a generous mixed diet, including nuts, milk, meat, eggs, with cereals, vegetables and fruits, constitutes a diet containing the potential factors for the maximum milk production.

2. Hoobler, B. R.: Problems Connected with the Collection and Production of Human Milk, THE JOURNAL A. M. A., Aug. 11, 1917, p. 421.

DRIED FOODS IN WAR TIME

The present war has served not only to stimulate science toward new discoveries and direct the arts toward new inventions, but also to bring back into current use some of the "lost arts." Nowhere, perhaps, has this been more conspicuous than in the matter of food conservation. The comparative abundance of edible products in the immediate past, coupled with the liberal supply of the goods that procure such commodities by exchange, resulted in an extravagance and waste that have at length begun to be realized as the needs of an underfed world are being brought to our attention.

Perishable foods are produced in all parts of the globe. Their conservation by storage, canning, sun drying and desiccation has always been practiced; but among these methods, choice has fallen in recent times more and more to the canning process so that the other schemes have been abandoned and all but forgotten in quarters in which our grandmothers once practiced them in the days when modern facilities in the food industries and modes of transportation were not so universally available. The successful storing of fruits and vegetables in city homes has become all but impossible. Houses and apartment buildings are constructed with suitable arrangements for the storage of fuel sufficient usually for the needs of the entire year. Facilities for the storage of food — the human fuel — are never thought of. Heating devices have excluded the cold fruit and vegetable cellar of our boyhood days in all except the rural homes. Similarly there was a time when conservation by drying found widespread application. Some of the common fruits, such as prunes, raisins, figs, dates, apricots and apples, are staples in dried form in the world's markets. They are, however, preserved in dried fashion in the industries rather than in the home.

The government has lately engaged in an extensive propaganda to restore the lost art of food desiccation to its deserved place in the home.[1] Sun drying, drying by artificial heat, or drying by an air blast, such as an electric fan or blower will furnish, are all within the range of possibility even for very small quantities of food. Containers in the form of expensive tins or glass are not required. The problem of room in storage is negligible, and the elimination of water excludes the possibility of freezing, with its incidental damage, and the transportation of a bulk of water. The needed outfits can be simple and inexpensive. Times of plenty and low prices can be made to prepare for days of emergency.

Novelties in diet and in the culinary art inevitably find a wall of prejudice — the inheritance of tradition, habit and custom — that must be overcome. The

1. An excellent monograph on this subject may be obtained free from the Division of Publications, U. S. Department of Agriculture. It is entitled: Drying Fruits and Vegetables in the Home, with Recipes for Cooking, Farmer's Bull. 841, June, 1917, Washington, D. C.

physician, who plays the rôle of sage in many homes, can do a useful service in helping to dispel the attitude of distrust or dislike for the wholesome foods that old methods, revived in times of war, may prepare for us.

WHY WHEAT?

Wheat is a word to conjure with in these days. The Food Administration is making a strenuous effort to increase the production of this cereal in this country, and likewise to induce such economies in its use among our population as will enable us to share with our allies part of the total supply at a time when there is not wheat enough for all to have the usual amount of wheat flour. The tendency of Americans to concentrate in urban communities has led to a decrease in the per capita production of staple products. Thus the per capita production of wheat in the United States in the period 1906-1914 was 7.7 bushels per annum, a falling off of eight-tenths bushel per capita in comparison with thirty years before. There has also been a falling off in our relative exportation of such staple food products, with a corresponding tendency to home consumption.[1] This country has been becoming less able to feed other countries because it requires a larger proportion of the annual production to feed its own people. The crop of the all-important staple, wheat, in 1914 was unusually large, 891,000,000 bushels, so that the country was provided at the outset of the war with a large exportable surplus. Even better was the crop of 1915, which exceeded a billion bushels; but in 1916 there was a drop to 639,000,000 bushels, barely sufficient for home requirements, while the crop for the present year, in which the United States is more vitally concerned than ever before, is estimated at about 800,000,000 bushels, calculated to leave less than 200,000,000 bushels for exportation unless economies are practiced. There is a wheat shortage the world over.

Why, it may properly be asked, should so much emphasis be placed on wheat, among all the cereal crops? Is there some unique nutritional value in wheat not provided in comparable degree by other more available products? Would the substitution of other cereals to a greater or lesser extent impair the health or comfort of the needy nations? To these questions the physiologist of today must, we think, reply that the demand for wheat represents a psychologic and traditional impulse rather than any nonreplaceable need. Bread has been the "backbone of the diet of man" from time immemorial. Few of the cereals lend themselves satisfactorily to the production of a culinary product having the general texture, flavor and keeping qualities of bread. This is due in large measure to the chemical peculiarities of those proteins which make up the glutinous part of wheat, barley and rye. The baker at once places corn, oats and rice in a different category. Without some wheat flour, rye and barley flours cannot be used to good advantage in the manufacture of bread, although the mixed flours yield a palatable product. Most natives of our Southern States will insist, however, that corn breads are most acceptable; while to the rice-eating peoples the other cereals are far less palatable.

These indications are sufficient to suggest that a campaign of education might even succeed in altering inherited tastes. Corn, oats and rice have been popularized as breakfast foods in many quarters by the skill of the clever advertiser. Let us therefore examine the more purely physiologic aspects of the wheat question. The proteins of wheat flour consist of glutenin and gliadin in about equal proportions. Osborne and Mendel have shown that the latter is inadequate for the needs of growth, even though the protein is completely digested and well absorbed. Gliadin is comparatively deficient in its yield of the amino-acid lysin. The glutenin doubtless enhances the value of the total proteins of the wheat flour, although they still remain inferior to a mixture such as the total proteins of milk or eggs, for example. In criticizing the prevailing popular view that among cereal grains wheat is of superior nutritive worth, Hart, Halpin and Steenbock[2] have pointed to numerous experiments on mammals to the contrary. These leave little room for doubt that the wheat grain contains a mildly toxic material. In addition, the Wisconsin investigators just mentioned state that the wheat proteins are of inferior quality and may be responsible for some of the malnutrition that has repeatedly been observed when wheat has been fed excessively. Excessive wheat feeding to cattle or swine ultimately induces pathologic changes in the nervous tissue.[3] It has also been ascertained that young chickens tolerate excessive wheat feeding poorly, and then only when the mineral content of the ration is adjusted, the proteins of the wheat improved by the addition of casein, and a more liberal supply of fat-soluble vitamin furnished.

It would be an obvious exaggeration or misstatement to declare that wheat flour is an undesirable nutrient. The experience of generations contradicts this; and science makes no such unwarranted claim except for an exclusive diet in which wheat plays the chief rôle. Properly supplemented, wheat flour, like other cereals, becomes admirably adapted for use as a food. While something may be gained by raising the milling percentage so as to secure a larger extraction of flour from the wheat, the point to be emphasized is that no great physiologic deprivation is entailed by a

1. These statements are based on the statistics in the Columbia War Papers, Series 1, No. 6, Food Preparedness, by Henry R. Seager and Robert E. Chaddock, New York, 1917.

2. Hart, E. B.; Halpin, J. G., and Steenbock, H.: The Behavior of Chickens Restricted to the Wheat or Maize Kernel, II, Jour. Biol. Chem., 1917, **31**, 415. Hart, E. B.; McCollum, E. V.; Steenbock, H., and Humphrey, C. G.: Wisconsin Agric. Expt. Sta., Research Bull., **17**, 1911; Jour. Biol. Chem., 1912-1917.

3. Hart, E. B.; Miller, W. T., and McCollum, E. V.: Jour. Biol. Chem., 1916, **25**, 239.

restriction in the daily intake of wheat flour and a substitution of other more abundant appropriate sources of energy and protein.

It will require more than a few months or even years to dispel the popular belief in the nonreplaceable dietary virtues of wheat and to create a sympathetic attitude toward substitutes in the ration. Stern necessity has presented a situation that calls for relief in the way of retrenchment in the use of wheat. If a low bread ration is to be an inevitable outcome of the war either at home or abroad, let us keep constantly before the public the advice that not all nutrient virtue is limited to wheat bread and to meat. No teaching can be thoroughly successful, however, unless its truths are fully appreciated by those who attempt to inculcate them.

Current Comment

A WORD FOR THE OYSTER

The advent of the season in which oysters return to popularity in the human dietary brings into prominence anew all the problems of hygiene and food value that cluster around these shellfish. The floating of oysters will be subjected to critical examination, particularly with reference to the determination of what shall constitute adulteration. Sometimes oysters are floated in the shell; shucked oysters may be washed with water before they are marketed; and retailers sometimes immerse open oysters in tap water from which they are sold after standing varying lengths of time. An undue content of water acquired in any of these ways is quite as much an adulteration from the standpoint of the actual nutrients present as is the dilution of milk with water. Yet, after all, from the standpoint of health the real menace in the practice of floating oysters lies not primarily in the decrease in food value but rather in the possibility of infection through the use of contaminated water. Shellfish in certain localities sometimes exhibit a greenish color which has been attributed to copper. It is true that oysters may contain this metallic element in measurable quantities. Copper is a component of the colorless blood of many of the invertebrates, just as iron is a part of the hemoglobin of the red blood. Investigations at the New Jersey Experiment Station[1] have shown, however, that various samples of shellfish, which are alike in showing the green color, are unlike in respect to the amount of copper present. The metal may be absent from the colored substance in some cases, and some samples of uncolored shellfish may contain more of the metal than others which are colored. There is, therefore, no reason to believe that the green color is due to copper. At a time when all available forms of animal food must be rendered acceptable as far as possible, it is well to relieve the oyster of any undeserved opprobrium that may have been associated with a much investigated food.

1. Nelson, J.: The Copper Content of Green Oysters, New Jersey Stas. Report, 1915, p. 242.

MOBILE CLINICAL LABORATORIES

An item representative of the application of modern science to the conduct of "military business" is the announcement that the Medical Advisory Committee of the Red Cross War Council has decided to equip five railroad cars for use as laboratories. These laboratories will do emergency work in case of possible outbreak of epidemics in cantonment camps in this country. Each car is to have a staff of five or more experts. The cars will be so stationed that any cantonment can be reached within twenty-four hours on receipt of request from the federal or state authorities. The laboratory is the handmaiden to the practice of scientific medicine. In some conditions the laboratory findings may be of even more importance and of more value than those made by physical or clinical methods. In the recent epidemic of infantile paralysis the medical profession received startling evidence of the increased importance of laboratory investigation. The pathologist, the immunologist, the hygienist and the epidemiologist were drawn into conference on ways and means to combat the disease. In the recognition of the first alarming signs of infectious disease, the laboratory is of primary importance. Of even more importance is the detection by laboratory methods of those healthy carriers of disease who are the chief means of propagating and spreading the contagion. It is this work which will probably occupy, to a great extent, the services of the laboratory cars.

DO THE KIDNEYS CONTAIN SECRETORY NERVES?

The nerves of the kidney are derived from the sympathetic system, and the rich supply is distributed chiefly to the muscular walls of the renal blood vessels. Nerve fibers probably also reach the uriniferous tubules of both the cortex and the medulla of the kidney; and their terminal fibrils are reported to penetrate between and even into the cells of the convoluted tubules themselves. There seems to be no doubt that the plexus of nerves going to the kidneys has a vasomotor function which profoundly influences the work of the glandular structures in the formation of urine. In view of the added histologic picture so suggestive of direct nervous intervention in the secretory work of the kidney, one naturally inquires whether or not secretory fibers exist for these organs. Some time ago Quinby approached this question by the ingenious plan of studying the performance of a kidney which had been removed from the body and subsequently restored to its normal circulation by means of suture of the blood vessels. In this way it is possible to be sure that the kidney is freed from all nerve control, for a time at least. At varying periods after the operation, the function of the reimplanted kidney was studied by comparing it with that of the intact organ. Sooner or later a normal performance in respect to urine formation ensued. As it was repeatedly found possible for a single reimplanted kidney to maintain the normal existence of an animal after removal of the kidney on the opposite side, the evidence pointing toward the existence of specific secretory nerve fibers was ren-

dered dubious if not actually negligible. More recently the same investigator[1] has carried the study a step farther by examining the action of diuretics on reimplanted kidneys. It seemed possible, of course, that diuretics which do not cause increase of general blood pressure may act by stimulation of secretory nerves if we suppose that they exist. As examples of the three familiar types of diuretics, sodium chlorid in hypertonic solution, urea, and caffein or theobromin sodium salicylate were used. A series of observations was first recorded from normal animals, after which the same method was applied to those bearing a reimplanted kidney. It was found that the type of reaction shown by the normal and reimplanted kidney is practically identical for the same diuretic. Here again, Quinby remarks, as in the series of observations already referred to, there is no evidence of abnormality on the part of the reimplanted kidney, its response to diuretics being the same as that of the intact organ. In other words, the reimplanted kidney shows no evidence of loss of any possible secretory nerve influence. The burden of proof of the existence of renal secretory nerves has thus been shifted to the shoulders of those who still maintain that there are such paths of influence to the gland cells.

THE VENEREAL PERIL TO OUR ARMY

The serious havoc wrought among the armies of Europe by venereal diseases — in fact, among all armies not only those of today, but also among those of the past — has only recently been realized. Now it is known that venereal infection is the cause of more sickness among soldiers than any other disease or groups of related diseases. As Colonel Keefer says: "Venereal infections are responsible for an enormous amount of sickness in the army — vastly more than any other cause — and constitute the most important health problem with which we have to deal." This, it must be remembered, relates to the time of peace. Quoting from a special report by Vernon Lyman Kellogg:[2] "Syphilis and the other venereal diseases are a scourge fostered especially by militarism." The Surgeon-General's Office has already worked out a program for the coordination of the activities available for the control of these diseases. The reading of this program, printed in THE JOURNAL last week,[3] indicates that the importance of the problem has been thoroughly appreciated and that there need be no anxiety in this regard so far as it relates to our Army. In working out this scheme of action, Surgeon-General Gorgas called to his assistance some of the leading specialists on the subject.[4] The program, especially as it relates to prophylactic measures, necessitates the cooperation of the civilian authorities and especially of the civilian physician. Gonorrhea and syphilis are preventable diseases. Ultimately every case of either of these diseases among the men in the Army, if traced back to its origin, will be found to depend on a similar case in the civilian population. Hence, unless the medical officers in the Army camps have the complete cooperation of civilians located in the communities surrounding the camps, it will be impossible for them to carry out the proper measures for limiting these diseases among troops. Here lies the opportunity for the civilian physician to do his "bit" effectively. He should be prepared to recognize these diseases in their early stages, and to see that the patients under his control are properly informed as to the dangers of transmitting the diseases. The principles for the control of syphilis and gonorrhea are no different from those used to control other infectious diseases. They involve the best possible care and attention to patients and the prevention of the spreading of infection from these patients to other persons in the community. The important points to be emphasized are that the civilian physician should satisfy himself that he is thoroughly capable of making an early diagnosis of these cases according to modern methods of diagnosis, and that he should be ready to cooperate with the federal and state authorities in whatever efforts may be made to control and suppress this scourge. County societies of the counties in which the cantonments are located should be especially alive to their responsibilities and opportunities.

1. Quinby, W. C.: The Action of Diuretics on the Denervated Kidney, Proceedings of the American Physiological Society, Am. Jour. Physiol., 1917, **42**, 593.

2. Kellogg, V. L.: Military Selection and Race Deterioration, published by the Carnegie Endowment for International Peace, Oxford, the Clarendon Press, 1916, p. 194.

3. Program of Social Hygiene for Soldiers to Safeguard Their Morals and Health, Outlined by Surgeon-General's Office, THE JOURNAL A. M. A., Aug. 25, 1917, p. 654.

4. The Surgeon-General's Advisory Committee consists of Dr. William Allen Pusey, Chicago, chairman; Dr. Francis R. Hagner, Washington, D. C.; Dr. Grover W. Wende, Buffalo; Dr. S. Pollitzer, New York; and Dr. Henry H. Morton, Brooklyn. This advisory committee has been working directly with Col. F. F. Russell of the Medical Corps of the Army, under whose general directorship the matter comes.

THE DISTRIBUTION OF GLUCOSE IN THE TISSUES

In the study of the peculiar fate of sugar in the diabetic organism, much attention has been directed to the altered concentration which glucose attains in the blood, to the conditions under which it is excreted by the kidneys during hyperglycemia, and to the possible alterations in the storage functions of the liver with reference to carbohydrate. Comparatively little has been ascertained about the varying rôle played by the other tissues, notably the muscles which comprise three sevenths of the body weight and thus afford any opportunity for large differences, from a quantitative standpoint. It is a well established fact that the diabetic is unable to burn up sugar as satisfactorily as the healthy subject. It may properly be asked whether there is a possible difference between normal and diabetic organisms in their ability to hold carbohydrate in the form of glucose in their tissues. Earlier observations on this question may be neglected here because the evidence which they afford is conflicting and unreliable. Palmer[1] has reinvestigated the amount of carbohydrate existing as glucose in the tissues of animals under a variety of conditions. At any one time the amount is almost always small. Palmer has found that the concentration of glucose in the tissues varies directly with the degree of hyperglycemia. The largest

1. Palmer, W. W.: The Concentration of Dextrose in the Tissues of Normal and Diabetic Animals, Jour. Biol. Chem., 1917, **30**, 79.

amount of sugar was found in the liver, and the smallest quantity in the brain, the difference being largely accounted for by difference in vascularity. The concentration of glucose in the tissues is invariably lower than the blood sugar except in the liver, in which the higher concentrations found may be explained by rapid glycogenolysis. In the muscles the amount of glucose is low, varying in normal animals between 0.04 per cent. when the blood sugar is 0.10 per cent., and 0.41 per cent. when the blood sugar reaches 1.05 per cent. after intravenous sugar; while in diabetic animals the muscle sugar falls within the normal limits, even though the hyperglycemia rises as high as 1.43 per cent. Normal animals have a higher concentration of glucose in striated muscle than diabetic animals, when the levels of blood sugar are comparable. Palmer has properly emphasized his finding that diabetic animals present little difference in respect to glucose in muscles. The amounts found, he states, are small, and apparently not influenced by the type of diabetes or sugar administration. In view of the above-mentioned fact that, when comparative blood sugar values are considered, the muscle of the diabetic animal contains less glucose than the normal, Palmer has suggested that diabetic tissues are more impermeable to sugar than normal ones. Corresponding with this, sugar injected into the circulation of diabetic animals does not leave the blood so rapidly as it does in normal animals. But despite the increasing information as to the distribution of the carbohydrate in the body, the major problem of the failure to metabolize the sugar in one organism in contrast with the readiness of its combustion in the other still remains a perplexing puzzle.

BIOCHEMICAL PROCESSES FOR SYNTHETIC CHEMICALS

The enormous expansion of the synthetic chemical industry has furnished a great profusion of new compounds in recent years. Many of these substances have found an application in modern medicine. Indeed, medical practice has come to depend to quite a considerable extent, both in its therapeutic and in its hygienic or prophylactic applications, on synthetic chemicals. It is interesting to bear in mind, therefore, that biologic forces are available for the production of chemical products on a scale that few not specially versed in the subject appreciate. Yeasts, molds and bacteria give rise to a great variety of substances as the result of their metabolism. The yields of some of the compounds are not infrequently considerable. It has been said that no factory can compete with micro-organisms in the economy of production of certain compounds. The use of the biochemical modes of manufacture is still comparatively unexploited. Already many substances of great technical value, such as ethyl alcohol, acetic acid, butyric acid and lactic acid, are prepared by biochemical processes. Currie[1] has recently shown that citric acid can be produced in surprisingly large amounts by the growth of the familiar molds of the *Aspergillus* type on mediums of comparative simplicity, sugar being the most essential source. It is not far fetched to look forward to the greater development of such fermentation industries whereby many of the substances now prepared by expensive synthetic methods may be more economically manufactured through the intermediation of biochemical processes.

1. Currie, J. N.: The Citric Acid Fermentation of Aspergillus Niger, Jour. Biol. Chem., 1917, **31**, 15.

MEDICAL STUDENTS AND THE DRAFT

For the last three weeks THE JOURNAL has been publishing statistics in regard to the relation of medical students to the draft, based on replies obtained direct from the students themselves. According to the replies obtained, it was estimated that 8,983 (85.9 per cent.) of all students were registered and that of these 2,551 (28.4 per cent.) would be included in the first call. As stated last week, it was believed the latter estimate was too low. At the time our first questionnaire was sent out it was too early to obtain absolute facts as to what students were actually called or whether they were accepted or rejected. On August 23, therefore, as the examinations by exemption boards were about completed, we sent a second questionnaire to 2,500 of the students who, following the previous questionnaire, had been included in the first or second calls. This second questionnaire asked whether the student had actually appeared before an exemption board and whether he had been accepted or rejected. Owing to the shortness of time since the questionnaire was sent out, not all replies have been received; an analysis of the returns, however, supports our previous figures or, if anything, indicates that our previous estimates as to the number of medical students conscripted were too low. We hope to be able to give the final figures next week.

CARBON DIOXID AND THE REGULATION OF RESPIRATION

The nature of the mechanism which regulates respiration has come to be understood of late more intelligently than it possibly could have been so long as the chemical aspects of the process were not taken into account. The respiratory center is now recognized as being singularly responsive to seemingly slight variations in the composition of the blood that comes to it. A small increase in the discharge of acid catabolites, notably carbonic acid, into the circulation as the result of muscle work or other forms of cellular activity promptly starts the breathing apparatus functioning more vigorously. For some time it has been assumed, partly on the basis of supposedly valid scientific evidence, that the stimulation of respiration in this way is attributable to changes in the hydrogen ion concentration of the blood quite independent of how these are brought about. According, however, to the newest researches at the Johns Hopkins University by Hooker, Wilson and Connett,[1] carbonic acid, the most abundant and conspicuous of the waste products of metabolism, exerts a specific influence on the respiratory center independent of its effect on the hydrogen ion concentration or true acidity of the fluid perfusing

1. Hooker, D. R.; Wilson, D. W., and Connett, Helene: The Perfusion of the Mammalian Medulla: The Effect of Carbon Dioxide and Other Substances on the Respiratory and Cardio-Vascular Centers, Am. Jour. Physiol., 1917, **43**, 351.

it. For example, blood with a comparatively high tension of carbon dioxid causes a greater stimulation of the respiratory center than does blood with a lower tension of carbon dioxid, but with the same acidity measured in terms of the hydrogen ion concentration. The discovery of this special sensitiveness or reactivity of the respiratory mechanism to one of the products with the elimination of which it is so prominently concerned is not without great interest. Precisely how the unique response is accomplished remains to be unraveled. The carbon dioxid as such may stimulate the respiratory center; or the irritability of the center may be altered by variations in the concentration of carbon dioxid. Perhaps, as the Baltimore investigators suggest, the hydrogen ion concentration of the environment of the respiratory center is its effective stimulus, but the irritability is influenced by other factors. The normal irritability might accordingly be the resultant of a number of effects, including, as Hooker, Wilson and Connett imply, those produced by carbon dioxid, oxygen and various ions as well as changes in metabolic activity, the nature of which is not understood.

Medical Mobilization and the War

Red Cross Commission to Serbia

The War Council of the American Red Cross announces the sending of a commission to Serbia to begin relief work to help the population in its struggle against privation and disease. Two hundred thousand dollars has been appropriated to buy medical and other supplies for use among the refugees on the Macedonian front. The commission is headed by Mr. C. A. Sevverance, a lawyer of St. Paul, and as deputy commissioners there will go Dr. S. Burrage, sanitarian, formerly of the Massachusetts Institute of Technology; Dr. Frederick T. Lloyd, Boston; Dr. Eugene A. Crockett, Boston; Mr. Francis Jager of the University of Minnesota, and Mr. Edwin D. Haskell of Minneapolis. Two other members of the commission are W. A. Stewart of New York, and L. D. Wishard of Pasadena, Calif.

Total Personnel of Army Medical Department

The strength of the enlisted force connected with the Medical Department of the Army is stated to be over 60,000 at this time. It is divided as follows: Regular Army, 25,096; enlisted Reserve Corps, 15,002; sanitary troops of the National Guard now in the National Army, 20,000. Orders have been issued for the assignment of six noncommissioned officers and 120 privates, first class, or privates to each National Guard contonment for duty at the base hospitals connected therewith; including one noncommissioned officer and fifteen privates, first class, or privates previously sent. Each cantonment will have available for duty, seven noncommissioned officers and 135 privates. One hundred enlisted men will be assigned to each base hospital connected with the National Guard cantonments. Orders directing these assignments are now being prepared.

Department of Military Orthopedics

The Surgeon-General of the Army announces the organization of a new department for military orthopedics. It is stated that from 30 to 40 per cent. of the casualties of the present war require special orthopedic methods and that from 70 to 75 per cent. of these patients when treated by these methods can be restored to military usefulness.

Major Elliott G. Brackett, M. R. C., U. S. Army, Boston, has been appointed director of military orthopedics, with headquarters at the Surgeon-General's Office. Major David Silver, M. R. C., U. S. Army, Pittsburgh, has been appointed assistant director. Major Joel E. Goldthwait, M. R. C., Boston, has been appointed director of military orthopedics for the expeditionary forces, and Major Robert B. Osgood, Boston, now serving with Base Hospital No. 5, and Capt. Nathaniel Allison, St. Louis, now serving with Base Hospital No. 21, will be transferred from their present positions to act as assistant directors abroad. Major Osgood will be temporarily assigned to Col. Robert Jones of the British forces. To assist these directors an advisory orthopedic board has been created and is made up as follows: Drs. Robert W. Lovett, Boston; Albert H. Freiberg, Cincinnati; G. Gwillym Davis, Philadelphia; F. H. Albee, New York, and John L. Porter, Chicago.

Payment of Medical Officers

Numerous physicians have written to THE JOURNAL asking when the pay of officers commissioned in the Medical Officers' Reserve Corps begins. An officer in the Medical Reserve Corps not on active duty receives no pay. Officers on the active list receive pay and allowances monthly on accounts certified by themselves according to prescribed forms. The pay begins with the time that the officer reports for active duty. Pay vouchers are made out monthly on form 336 W. D. and it is customary to send them to the Quartermaster on the 20th of the same month covered by the vouchers. The vouchers are made in duplicate, but only one voucher is signed. Mileage vouchers are made on form 337 W. D. and submitted in duplicate, one copy being signed. The original order of assignment to duty or certified copy with endorsements should accompany the mileage account. Officers are entitled to mileage from the place of appointment to their first station, the usual sum being 7 cents a mile; this covers all expenses as well as the actual railroad fare.

Early Medical Care of Recruits for the National Army

The men of the National Army will be prepared along the most modern hygienic methods for active duty. As soon as each recruit arrives at the cantonment, he will be required to take a bath and will then be given a new complete physical examination. Each recruit will be vaccinated for typhoid, paratyphoid and smallpox. Recommendations will then be made to the company commanders for special forms of exercise to remedy slight physical defects. The early weeks will also be utilized for setting up drills and preliminary schooling of the soldiers so that the men will become fit for the regular training which follows.

Division Surgeons Announced

The following members of the Medical Corps have been announced as division surgeons and ordered to report to the commanding officers at the various camps and contonments specified: Lieut.-Cols. Charles E. Marrow, Camp Lee, Petersburg, Va., Eastern Department; M. A. W. Shockley, Camp Devens, Ayer, Mass., Northeastern Department; Thomas L. Rhoads, Camp Meade, Annapolis Junction, Md., Eastern Department; Charles R. Reynolds, Camp Upton, Yaphank, Long Island, N. Y., Eastern Department; Jay R. Shook, Camp Dodge, Des Moines, Iowa, Central Department; George M. Ekwurzel, Camp Dix, Wrightstown, N. J., Eastern Department; Conrad E. Koerper, Camp Gordon, Atlanta, Ga., Southeastern Department; John H. Allen, Camp Taylor, Louisville, Ky., Central Department; Wallace De Witt, Camp Sherman, Chillicothe, Ohio, Central Department; Robert M. Thornburgh, Camp Pike, Little Rock, Ark., Southeastern Department; Paul S. Halloran, Camp Travis, Fort Sam Houston, Texas, Southern Department; Kent Nelson, Camp Jackson, Columbia, S. C.; Southeastern Department; Peter C. Field, Camp Lewis, American Lake, Wash., Western Department; Cosam J. Bartlett, Camp Custer, Battle Creek, Mich., Central Department, and James M. Phalen, Camp Grant, Rockford, Ill., Central Department. Major Charles C. Billingslea, Camp Funston, was assigned to Fort Riley, Kan., Central Department, but has since died.

Red Cross Ambulance Companies in France

Forty-five ambulance companies organized by the American Red Cross have been mustered into the Army Medical Corps. These companies were all organized by Red Cross chapters. Each consists of 124 men, a captain, 40 lieutenants, 2 first-class sergeants, 11 sergeants, 6 corporals, 1 mechanic, 3 cooks and 96 privates. Four ambulance companies are assigned to service with each Army division.

Eleven of the companies are at Allentown, Pa., in training for service in France. These companies are: Pasadena Company, Capt. Charles D. Lockwood; University of California Company, Capt. Alvin Powell; Washington (D. C.) Company,

Capt. Ryan Devereaux; Fordham University Company, Capt. Joseph Donnelly; University of New York Company, Capt. Chester F. S. Whitney; Columbia University Company, Capt. William H. Rockwell; Battle Creek Company, Capt. James T. Case; University of Washington Company, Capt. David C. Hall; Boston Company, Capt. E. A. Cunningham; Portland (Me.) Company, Capt. Ernest B. Folsom, and the Columbia (S. C.) Company, Capt. Marion H. Wyman.

The two Atlanta (Ga.) companies, under Capt. Leo. P. Daly and Capt. Walpole C. Brewer, have been assigned to Fort McPherson. The Greensboro (N. C.) Company, under Capt. Charles S. Lawrence, is at Fort Oglethorpe. The Summit (N. J.) Company, under Capt. William H. Lawrence, is in camp at Butler, N. J. The San Antonio (Texas) Company, under Capt. Homer T. Wilson, at the request of the governor of Texas, is with the Texas National Guard on the border.

The other companies are to be assigned with the National Army at the various cantonments. There are the University of Chicago Company, Elbert Clark, captain; Cleveland Company, Dr. Harold O. Ruh, captain; Detroit Company, Charles Barton, captain; Northwestern University Company, Stephen V. Balderston, captain; Pittsfield Company, Robert J. Carpenter, captain; University of Oregon Company, John E. Kuykendall, captain; Grand Rapids Company, Thomas D. Gordon, captain; Fredonia (Kan.) Company, Edgar C. Duncan, captain; Indianapolis Company, Mason B. Light, captain; Portland (Ore.) Company, Ernest H. Streit, captain; Flint (Mich.) Company, Walter H. Winchester, captain; Charleston (W. Va.) Company, Timothy L. Barber, captain; Kansas City (Mo.) Company, Ernest W. Cavaness, captain; Rutland (Vt.) Company, William Stickney, captain; Detroit Company, Griffith A. Thomas, captain; Salt Lake City Company, Hugh B. Sprague, captain; Denver Company, Thomas M. Hopkins, captain; Greenville (S. C.) Company, James E. Daniel, captain; Hudson County (N. J.) Company, Frederick J. Quigley, captain; Houston (Texas) Company, Claude C. Cody, captain; Minneapolis Company, Ralph T. Knight, captain; Vicksburg Company, E. F. Howard, captain; Fort Worth (Texas) Company, Dr. Will S. Horn, captain; Lock Haven (Pa.) Company, George D. Green, captain; Michigan Company of Flint, Dr. F. A. Roberts, captain; Raleigh (N. C.) Company, Charles L. Scott, captain; Topeka Company, C. H. Lerrigo, captain; Memphis (Mich.) Company, Walter R. T. Sharpe, captain, and the Omaha (Neb.) Company, A. A. Linquist, captain.

Pediatric Expeditionary Force

At the head of a group of specialists in infant welfare which has been sent to France by the American Red Cross is Dr. William P. Lucas, professor of pediatrics in the University of California.

The total deaths in France in 1916 were about 1,100,000. Births numbered only 312,000. The net loss in population was 788,000, or nearly 2 per cent. of the whole. In Paris, where 48,917 babies were born in the year ending Aug. 1, 1914, only 26,179 were born in the second year of the war, ending Aug. 1, 1916.

With Dr. Lucas in the unit, which was financed by Mrs. William Lowell Putnam of Boston, are Dr. J. Morris Slemons of the Yale Medical School; Dr. Julius Parker Sedgwick, physiologic chemist, professor at the University of Minnesota; Dr. John C. Baldwin, Pittsburgh; Dr. Clain F. Gelston, Dr. Lucas' assistant at the University of California; Dr. N. O. Pearce, Cloverton, Minn., and the following experts in sociology and child welfare work: Mrs. J. Morris Slemons, Mrs. William P. Lucas, Miss Elizabeth Ashe and Miss Rosamond Gilder, daughter of the poet.

These specialists will make a general survey of the situation and study the work already being done, and will practice without compensation. It is intended to carry on a general education campaign among French mothers in the interest of better prenatal hygiene and scientific feeding and care of the babies.

Medical Supplies for Russia

In response to an urgent request from Dr. Frank Billings, head of the Red Cross Commission to Russia, the American Red Cross is sending a large quantity of medical and surgical supplies to meet the urgent needs of the Russian military hospitals. This supplements an earlier consignment which was forwarded for immediate use when the commission sailed to investigate the Russian situation. The commission carried with it $200,000 worth of such material, including among other supplies over 50 microscopes and 45,000 slides; 4,600 clinical thermometers, 288 operating knives, 23,000 lengths of catgut, 1,700 ice caps, 175,000 morphin sulphate tablets and 200,000 antiseptic tablets.

In the new consignment, for which the War Council appropriated $160,000, there are 180,000 tablets of quinin sulphate, 1,000 pounds of chloroform, 10,000 tablets each of atropin and strychnin for hypodermic injection, 50,000 doses of antityphoid vaccine, also tetanus antitoxin and diphtheria, smallpox, cholera and plague vaccine, 10,000 pounds of soap, 25 dozen hot water bottles, 10,000 pounds of gauze dressings and pads, 10,000 bandages and rolls, 1,000 blankets and 6 dozen stethoscopes, and various laboratory supplies.

Among the other items in the shipment are these: 5,000 c.c. of digitalis, 1,000 cocain tablets, twenty collapsible operating tables, 14,400 needles, 200 pounds of rubber tubing, 20,000 pounds of absorbent cotton, and 5,000 safety pins.

Henry P. Horn, formerly a vice president of the New York, New Haven and Hartford Railroad, a member of the commission, is cooperating with the American Railroad Commission previously sent to Russia in securing the quickest possible handling of these and the other relief shipments which will follow as they are called for by Dr. Billings. He has worked out a plan for identifying Red Cross consignments so that Russian railway men will facilitate their movement, and in spite of the congestion of the railroads it is hoped that these supplies will be in the hands of surgeons and nurses in the Russian army hospitals in a short time.

Physicians Recommended for Commission in the Medical Reserve Corps

During the week ending Aug. 25, 1917, 415 physicians were recommended for commission in the Medical Reserve Corps, the proportion being 10 majors, 72 captains and 333 lieutenants.

Books for War Prisoners

The British have what is known as the British Prisoners of War Book Scheme which aims to provide British prisoners with books of all kinds. According to the *Lancet* the demand for technical and scientific books is very great. They are hard to get as contributions, as their owners usually need them, and second hand books of sufficiently late date are almost unobtainable. The committee has been compelled to make large purchases of new books, and funds are asked. It is said that the donors will recognize that gifts for this purpose not only serve to save the prisoners from mental starvation, but increase their value as commercial and professional assets after the war. Offers of books or gifts of money (the former with lists) should be sent to Mr. A. T. Davies, C. B., Prisoners of War Board of Education, Victoria and Albert Museum, South Kensington, S. W. 7, England.

Cancellation of Leases for Reserve Officers

The Chicago Rotary Club is making a special effort to aid physicians who have been called to active duty in disposing of any leases which they may have and which would continue during their period of service. Some corporations from which physicians rent have refused to cancel leases. In its announcement, the Rotary Club says:

> "It seems to the Chicago Rotary Club that when physicians are so much needed in the United States Army, every effort should be made to relieve them of contracts rightfully binding in times of peace, but which might better be waived in times of national peril.
>
> We all know that the physician giving up an established practice to enlist makes perhaps the biggest sacrifice of us all, because his business depends absolutely on personal contact. The day he leaves, his business ceases. But his lease goes on. Yet our country is calling for more physicians, and many patriotic doctors everywhere are trying to arrange their affairs to go.
>
> It is possible to create a strong public opinion favoring the canceling of leases in such cases. If advisable, the matter can be carried for consideration to Congress. But first, the Physicians' Lease Committee wants figures and facts. We are sending this letter to 20,000 physicians scattered all over the United States."

Physicians who may be personally interested or who have knowledge of other physicians who have joined the Medical Reserve Corps and are having difficulty in securing the cancellation of leases, will render aid to this movement by addressing Mr. R. R. Denny, Chairman of Lease Committee, Chicago Rotary Club, 359 East Ohio Street. But it is not leases alone; it is the fact that the mortgage on their homes is coming due this fall or next year, that is causing anxiety to some Medical Reserve Officers.

Report of Lord Charnwood on Criticisms of the Medical Service of the British Expeditionary Forces in France

July 5, 1916, Lord Charnwood made a report to Sir Alfred Keogh, director-general of the British Medical Services, concerning certain criticisms made in the House of Lords on the arrangements of the medical service for the care of the wounded and sick of the expeditionary force in France. At the request of the director-general, Lord Charnwood spent the time from June 19 to 29, 1916, in France. He visited, inspected and studied the organization and working of the whole hospital and medical service from casualty clearing stations to base and general hospitals and other institutions. He was given the freest opportunity and aid in inquiring into every phase of the situation from persons of every rank and degree of authority, from wounded privates to officers of the various grades. An effort was made particularly to question and get the point of view of those making definite criticisms of the service. In addition to the inquiry regarding the workings of the medical service proper, he investigated, in a number of instances, the sanitary arrangements and the efficiency of the sanitary service.

Preliminary to giving the results of his investigation he describes the features of the system of dressing and clearing stations, ambulances, base, general and other hospitals, and the apportionment of the service rendered by each, most of which is familiar in a general way to our readers.

The criticisms on which the investigation was undertaken were of two classes: It had been alleged that through defects of organization or of energy the wounded and sick were not cared for as they should have been. It was emphatically asserted that the provision for the wounded and sick was splendidly effective, but that it was conducted without due economy of personal services, and therefore resulted in the unnecessary withdrawal from England of men who could ill be spared. The latter criticism, it was said, was more widespread, but that so far as it took a hostile form it was based on the same arguments. To the criticism that the system of evacuating and caring for the wounded in the various stations and hospitals had been devised for the South African War and was not adaptable to present conditions, Lord Charnwood says that no one would be able to say that this was so without having gone over the ground and eliciting the experience of a number of officers engaged in the work. This Lord Charnwood did, and his conclusion is that the existing system provides admirably for present needs and is speedily adaptable to future needs. It is a subject of a very peculiar kind, and he found the officers concerned in it experts with peculiar experience and resourcefulness in carrying it out. An objection was made by one critic that the system of base hospitals should be much nearer the front, to which wounded men should be brought direct from the advanced dressing stations by motors over any available road without reference to the movements of reinforcements, munition or food trains. This criticism was dictated, it is said, by the special interest of the critic (who was not a surgeon) in grave abdominal wounds; but as these wounds constitute only one in forty-two of wounds occurring, and as practice in regard to them had recently changed materially, the criticism had not sufficient basis and was barren of practical suggestion. Lord Charnwood suggests that this and much similar criticism proceeds from a wrong standpoint.

In regard to delay in removing the wounded from the field or the trenches into the hands of a competent surgeon, it is found that instead of delay the inquiry showed extreme rapidity, in some instances amounting to only five hours, which the report finds is more rapid than would be the case of a person wounded in an English village. The impression among the surgeons was found to be that any such delay was not serious or avoidable.

The criticism that the field ambulances were unnecessary and that the wounded should be moved directly from the advanced dressing stations to the casualty clearing hospitals without stopping at the intervening field ambulances, thus setting free "thirty doctors in each division for other and more useful work," is regarded as "quite idle." The advanced dressing stations are manned from the field ambulances, and in case of the abolishment of the latter, the former would have to be more heavily manned; the criticism is also based on a misconception of the sort of work done by the field ambulances. Casualty clearing stations are sometimes cut off from the advanced dressing stations by barrage fire. The opinion is expressed that the field ambulances must be kept in constant readiness and training for a difficult, exacting and important duty, and to whatever extent it may be possible to economize in the matter of particular field ambulances at particular times, any effort to supplant them by "scratch teams" as occasion requires would certainly be foolish. The report goes on to say in regard to field ambulances in reserve:

> The suggestion which I have just tried to answer is somewhat amended by saying merely that the field ambulances of divisions in reserve are superfluous. I think probably that at some past time in the war before either the demand for doctors had become urgent or the enormous organization which had to be built up had reached its present high degree of development, there were many doctors in the field ambulance suffering from insufficiency of work. I can only say with certainty that this was not so when I visited France. Divisions or brigades were not apt to be at rest for long. The officer commanding the field ambulance which I happened to see attached to a unit in reserve explained to me the value which for the sake of the efficiency of his field ambulance he ascribed to this comparative rest. It was, he said, most important to him for the purpose of overhauling the equipment. I was informed on the highest military authority that it was impossible even to regard any single division as presumably to remain in reserve for the next ten days. This would not necessarily preclude the sort of economy in men to which I am about to refer, but it seems to show that every field ambulance should be permanently in such a state that it can be raised to a fully effective condition at a moment's notice. . . . . The medical service with our forces in France is a single service in which the constant endeavor is made to place the available man at the spot where he is wanted.

On the question as to whether or not unnecessary numbers of physicians are employed, it is said in the report:

> I observe that field ambulances when in full employment are obviously and admittedly not overstaffed, and that the war has now plainly entered on a stage when no responsible critic from outside would dare suggest that a single field ambulance should be kept unready for action. As to casualty clearing stations, I have never met with a suggestion that they are overstaffed. It has, however, been suggested that the various units used for the purpose of conveyance are overstaffed with medical men. In the case of hospital ships, hospital trains and hospital barges this has not, I think, been seriously urged.

On the point that three medical officers to each motor ambulance convoy is excessive, it is admitted that they are in a position of constant waiting for emergencies which for many days together may not arise; but the total number of officers in this service does not amount to one for every division of the expeditionary force, and no one would wish to abandon this arrangement.

The number of physicians for a base hospital with a given number of beds as laid down in the regulations before the war, based on the experience of former wars, is found not to be sufficient, as the admissions are liable to increase with an enormous rush and the number of serious and difficult cases to the total admissions rises enormously at such times. During the rushes which had actually taken place, the work had been very severe indeed. An effort to economize the services of surgeons was made by sending surgeons to the casualty clearing stations in the beginning of rushes and back to the base hospitals later at the height of the rush in those hospitals.

The complaint that the time of physicians is wasted in doing clerical work is answered by saying that it is necessary to send case records when the men are evacuated or sent back to England, and the making of these records can be properly done only by medical men and is of great importance. The need for economy with reference to surgeons is admitted, because the demand for them is likely to grow; but the remedy is not in the reorganization of the medical profession abroad, but by the organization of the civil profession at home with reference to the military need, especially in the industrial centers where the number of doctors was too few before the war. But any attempt to increase the supply at home by curtailing the supply to the army would fail to meet the need just when the need is most felt.

The criticism had been made that the administration was at fault in "applying good men to relatively unskilled work," and "in putting incapable men to important work in certain cases." While it is admitted that this might have occurred in some instances, it is believed that such a state of affairs would not continue for long, and no complaint of this sort was heard by Lord Charnwood in France. As applied to the casualty clearing stations, which were mentioned in this connection, this work is so strenuous as to require the service of younger men, but each station had two skilled consultants under whom operations were performed by the younger surgeons.

We quote in full Paragraphs 32 and 33 of the report because of their immediate interest:

> 32. *Important Work and Incapable Men.*—It may fairly be presumed that in the early days of this huge organization formed in deadly haste, many things have had to be done by men of less capacity when somewhere in the neighborhood there were men of greater capacity. This of course is not a ground of complaint against the administration. It

is wholly denied that important work has ever, even in the earliest stages, been allowed to be undertaken by men who did not possess some guarantee of reasonable competence to perform it. I got the impression that the administration had been especially apprehensive of the risk that important operations should be lightly and hastily undertaken by men not fully qualified both to perform them and to judge of their necessity. Indeed, I strongly suspect that a good deal of grumbling which at one time seems to have made itself heard among the medical profession arose from the fact of this bias on the part of the administration. To almost all laymen capable of judging, a leaning in this direction will seem wise and beneficent. It has doubtless saved many arms and legs. As things are, there can certainly be no ground whatever for the suggestion that an operation is liable to be performed by a man not selected for such work on sufficient grounds. Such doubt as has been expressed in this country as to the qualifications of the staff by whom important operations are performed relates not to the base hospitals but to the casualty clearing stations. Now every single casualty clearing station has two surgeons, surgical specialists, who either possess the qualifications of *fellowship* (a high qualification) of the College of Surgeons of one of the three kingdoms, or (in exceptional cases) have been selected upon the advice of consultants of the first rank upon proof, given during the war, of their high capacity. And the care taken in selecting these men is not limited to an initial inspection of their previous record. The whole system is supervised in a manner to which I will refer later." In regard to the casualty clearing stations, it is to be noted that the field of choice is necessarily restricted to young men capable of bearing a heavy strain of work. The arrangements for operation in the casualty clearing stations are such that the younger surgeons do their work with the advice and help of the two specialists constantly at hand. In regard to the casualty clearing stations, one remark of the chief consultant surgeon is perhaps more reassuring than any detail that can be given as to their careful organization, fit though this is to compare with that of most hospitals at home—this statement to me of the care taken in selecting men and in effecting constant improvement concludes, "I hope I shall never think the casualty clearing stations perfect."

33. *Subordination of Skilled Civilians to R. A. M. C.*—It has occasionally been mentioned to me as a ground for complaint or at least surprise that able men drawn from civil practice have had to work under officers who had previously served in the R. A. M. C., but who were professionally their inferiors. The number of the original R. A. M. C. are very small in comparison to the whole number of doctors now in the service—not amounting, I think, to 1 to 10. With the exception of a few who have gained special distinction as surgeons (and some of the men whose distinction in this respect has been most widely recognized during the war are old R. A. M. C. men) this small number is almost entirely absorbed in administrative duties. The commandant of a field ambulance, a casualty clearing station or a base hospital, though not always, is one of these men, and the higher positions of command are entirely filled by them. Now surgeons and physicians, often of higher skill as surgeons and physicians, are subordinate to such officers in the sense in which the surgeons and physicians of the London Hospital or King's College Hospital are subordinate to Lord Knutsford or Lord Hamleden, though no doubt with this difference that the administrative heads of a military hospital in war are more constantly seen and felt than those of a civil hospital in peace time. The administrative duties of these officers are difficult duties for which they have been especially trained; in the case of the younger men by a careful course of preparation, in the case of the elder by experience in war, and they are duties for which an ordinary civil surgeon or physician, however capable, is little better prepared than many laymen might be. No one could read the report of the commandant of a field ambulance after a severe engagement without seeing that his task demanded highly trained faculties of organization and command of a sort which the experience of a civil practitioner does not call forth at all. This is equally true of the work of the director of medical services with an army and of his staff, and it is true in a different way and probably sometimes in a less degree of the officers in command of all units of the army medical organization. It would be extremely disparaging to the medical officers drawn from civil practice to suppose that they did not as a rule recognize this fully and gladly, and as a matter of fact I have been struck by the testimony which came to me in various ways and from different quarters as to the excellent spirit with which this large number of civilian practitioners have fallen into line in this great organization. But I should like to say a word as to the manner in which the old members of the R. A. M. C. discharge the kind of duties which have necessarily fallen chiefly to them. It would be merely impertinent of me to praise those of the superior officers whom it has been my great pleasure to meet, but I may be allowed to say that the energy, resourcefulness and unfailing cheerfulness with which young officers of the R. A. M. C. may be seen filling most difficult and arduous posts in advanced dressing stations, field ambulances and casualty clearing stations entitle their services to a very high place in the regard and affection of their country.

Contrary to the criticism that there was not a proper interest in the after-results of injuries, it was said that the hospitals at Bologne and Etaples were "alive with interest" in such subjects by men of high reputation in the various subjects. Dentists and oculists are now provided for. The equipment of casualty clearing stations and field ambulances was found, in accordance with the report of Sir Frederick Treves, to be complete, and there was no complaint on this account on the part of the surgeons on account of equipment and the readiness with which additional equipment was supplied.

With regard to the eminent consultants from civil practice brought to France to exercise a certain power of inspection and supervision over staff officers more immediately concerned with the treatment of patients and to give advice to the administration when required, the report, while approving the work of these eminent men, is not in favor of giving these consultants direct executive control, such as is exercised by administrative chiefs, or issuing authoritative instructions or pronouncements on the advice of these consultants generally or the majority of them on controversial questions of treatment.

The right scientific temper is found to prevail among the medical forces, a proper degree of discipline exists, and red tape is at a minimum with reference to the matter of the suppression of individual initiative. Special stress is laid on the statement that the impression should not be gained from the report that there is prevalent a hostile attitude toward the work of the army medical authorities. There had been some grumbling and some continued criticism on the part of individuals actuated by misguided zeal or in a few rare instances by sheer malignity. It was proper, therefore, that the public should be properly enlightened with reference to the true character of the criticism, involving, as it did, personal attacks on several officers, which were ill judged and very cruel. It is said that all criticism "will be astray which does not recognize in the service splendid achievement and the achievement of a splendid spirit."

Impressions of an Italian Medical Prisoner of War

The *Riforma Medica* publishes an interview with Dr. M. Mauro who has just been repatriated after two years of imprisonment in Austria, having been captured early in the war. He said "The thing that impressed me most of all was that the Austrian operating stations and ambulances are so far back from the firing line. None were nearer than 2 or 3 kilometers while the Italian posts are within a few hundred meters. This explains the small number of Austrian medical officers that the Italians have captured. There is a great scarcity of physicians in the Austrian armies, even though the age limit has been raised to 55 and lowered to a very youthful age. Owing to this scarcity, the military authorities guard their medical officers from capture with special care, thinking that the welfare of the wounded in the long run is best served by the long transportation back to the distant field stations. . . ." On account of the scarcity of medical officers even old dentists serve as physicians. Practically every man of the military age is serving with the army, no physical disability being recognized, as some place is found for every one to serve in some way. The only selection is for the men sent to the firing line. I have seen men in service with enormous hernias, with dilatation of the stomach, and especially with manifest tuberculosis. I recall one Austrian officer with tuberculosis of the larynx and tubercle bacilli in his sputum who yet was sent to the front, and one sentinel who had committed suicide and cavities were found in both lungs. Instead of leave of absence for convalescence or rest, the men are given a change of occupation, being sent to serve in some prisoners' camp or administrative office. "The conditions at our first prison camp, at Lubiana, were deplorable. The food was scant and poor and the Italian prisoners in our charge suffered in health. At that time the Red Cross had not organized its marvellous services, and the families of prisoners were able only with the greatest difficulty to send them any aid. A jail served as the hospital, but when we were transferred to Mauthausen, that wooden city near the Danube, we found hospital barracks equipped for 1,200 surgical beds and 2,000 medical and two isolation hospitals, with a special hospital for the troops guarding the prison camp. The first year the medical service was attended to by seven Italian and five Austrian physicians but the second year there were twenty-five Italian physicians. The beds were rarely empty, prisoners being sent here for treatment from other camps, and they comprised nearly every nationality. The hospitals were well equipped and the arrangements for sterilization and disinfection were excellent, but there was a deplorable lack of food, of drugs and of dressings. We physicians could point out the prisoners we thought should be given the preference for exchange or respite from being sent out to work, but our suggestions were seldom heeded. It happened several times that the men we proposed for exchange but who had been rejected by the control board, died within a few days from their tuberculosis or other affection." Mauro pays tribute to the beautiful example of fraternity in the humanitarian service presented by the Aus-

trian physicians in the camp, the chief surgeon in particular. He also pays tribute to the Italian attendants in the hospitals who without any previous experience became skilful and displayed such devotion that their service compares favorably with the largest hospitals anywhere. Mauro tended a total of 8,000 sick or wounded, and performed 800 operations. He says further, "There were many cases of severe malaria in prisoners from Albania and a few cases of typhus and cerebrospinal meningitis in the camp, but they never started epidemics. Many cases of rapidly fatal tuberculosis developed at both prison camps fostered by the exertions, the cold and the lack of food. None of the Italian physicians had any serious illness, and there was very little sickness among the Italian prisoners, testifying to their solid fiber. After the Red Cross had organized its service through the mediation of Switzerland, supplies of food and money arrived to supplement the scant ration of bean or carrot soup supplied by the Austrians, and thus the danger of inanition in the hospitals was warded off. The Naples branch of the Red Cross sent to Mauthausen not only food and comforts but also drugs and dressing materials in amounts enough for several months, and the Genoa branch sent money. The Austrians furnished for the entire 1,200 beds of the surgical department only 10 liters of fresh milk a day. A so-called milk powder was supplied but none of the sick could tolerate it. The broth was usually made with vegetables; a small ration of meat was extremely rarely allowed. The donations of the Red Cross made it possible to purchase additional supplies from Switzerland and from Italy. But it was exasperating for us physicians to be treated as prisoners and denied the slightest liberty. A change for the better in the conditions of the prison camp seemed to dawn with the death of the old emperor, the rations were less scanty and the air of the camp less depressing."

Orders to Officers of the Medical Corps

Lieut. Col. Carl R. Darnall, M. C., to duty with Surgeon General of Army.

Capt. Harry S. Purnell, M. C., to Fort McHenry, Md., and assume command of General Hospital No. 2, to be established.

First Lieut. Henry F. Lincoln, M. C., to duty as provisional regimental surgeon of 1st Regiment of Heavy Field Artillery to be organized in Maine.

Col. Weston P. Chamberlain, M. C., to Washington for duty.

Par. 50, S. O. 187, Aug. 13, War Dept., announces the promotions in the Medical Corps. To be colonels from May 15, 1917, from and including Henry D. Snyder to and including Clarence J. Manly. To be lieutenant-colonels from May 15, 1917, from David Baker to Fred W. Palmer, inclusive. To be majors from May 15, 1917, from May W. Bryan to Roy C. Heflebower, inclusive.

First Lieut. Olof I. Sohlberg, M. C., to Ambulance Co. No. 1, Minnesota, St. Paul, for duty.

Col. James D. Glennan, M. C., from duty at the U. S. Soldiers' Home and report in person to Surgeon General of the Army for duty in his office.

Major A. J. Wilson, M. C., to duty at Fort Thomas, Ky.

Orders to Officers of the Sanitary Corps

First Lieut. Frederick M. Schaefer, San. Corps, to duty at medical supply depot, Philadelphia.

First Lieut. J. M. Corson, San. Corps, to Camp Custer, Battle Creek, Mich., as supply officer of division and property officer of base hospital at that camp.

First Lieut. R. A. Lagrinder to Camp Lee, Petersburg, Va., as supply officer of division and property officer of base hospital at that camp.

First Lieut. H. J. Fiestel report to commanding general port of embarkation, Pier 45, for duty.

Capt. Gilbert J. Hurty, San. Corps, to duty, Atlanta, Ga.

First Lieut. Samuel Siegel, San. Corps, to duty Army Field Medical Supply Depot, Washington.

Orders to Contract Surgeons

Contract Surg. E. A. Albers report for examination of troops of national guard at Kansas City for tuberculosis.

Contract Surg. F. R. Burke to Boston for duty as a member of board of tuberculosis examiners.

Orders to Officers of the Medical Reserve Corps

ALABAMA

To Camp Cody, Deming, N. M., Lieut. Llewellyn H. Ledbetter, Good Water.

To Camp McClellan, Anniston, Ala., Capt. J. W. Hooper, Roanoka; Lieuts. T. M. Barnett, Dothan; W. M. Blair, Gantt; W. W. Burns, Selma; R. C. Evans, Sheffield.

To Fort Oglethorpe for a course of instruction, Lieuts. Modie E. Cunningham, William C. Dabney, Edgar W. Daly, Birmingham; J. Glenn Gilchrist, Brantley; Daniel B. Faust, Clayton; George W. Kiehnhoff, Daphne; Gilmer H. Moore, Opelika; Clanton R. Athey, Ramer; French H. Craddock, Sylacauga.

ARIZONA

To Hachita, N. M., Major George P. Stallman, Douglas.

ARKANSAS

To Camp Bowie, Fort Worth, Tex., Lieuts. W. K. Smith, Hot Springs; Robert E. B. Bledsoe, E. W. Prothro, Little Rock.

To Fort Oglethorpe for a course of instruction, Lieuts. William E. McLain, Argenta; Dewell Gann, Jr., Benton; David W. Goldstein, Ft. Arch S. Chapman, Mammoth Spring; Edward R. Cotham, Monticello; John B. Wells, Scott; James F. Poe, Shirley.

To Fort Riley for a course of instruction, Lieut. John W. Elder, Alicia.

To Kingsville, Texas, Major John M. Hewitt, Fort Logan H. Roots.

CALIFORNIA

To Camp Fremont, Palo Alto, Cal., Capts. R. Cadwallader, W. B. Deas, San Francisco; Lieuts. H. S. Keyes, Los Angeles; E. C. Houston, San Francisco.

To Camp John H. Beacom, Calexico, Cal., for duty, Capt. Alexander Patterson, San Francisco.

To Camp Kearney, Linda Vista, Cal., Lieuts. W. P. Milliken, Oakland; H. J. Willey, Porterville; J. M. Moss, T. E. Tillman, San Francisco.

To Camp Lewis, American Lake, Wash., for duty with Provisional Ambulance Co. B., Lieut. Raymond Babcock, Willits.

To Chicago for duty, Lieut. Jay M. Read, San Francisco.

To Fort Baker, Calif., for duty, Lieut. Louis Jean Ernest Gouguet, Chicago.

To Fort Ontario, N. Y., with Hospital Unit N., Lieut. Edwards H. William, Los Angeles.

To Presidio of S. F. with Provisional Ambulance Co. C. for duty, Lieuts. George M. Hubbell, Los Gatos; Pleasant A. Taylor, San Francisco; with Provisional Sanitary Train, Capts. Gustav J. Bergener, San Francisco; Sidney E. D. Pinninger, Tracy; Lieuts. John L. Beard, Martinez; Luther M. Leisenring, Placerville; Glover B. Wilcox, San Francisco; Lafayette J. Wilson, Sebastopol.

To report by telegraph to the commanding general Western Dept., for duty, Lieut. Edward H. Diehl, Artesia.

COLORADO

To Fort Benjamin Harrison for a course of instruction, Lieut. Earl W. Kemble, Golden.

To Fort Riley for a course of instruction, Capt. John S. Fox, Silverton.

To Presidio of S. F., with Provisional Sanitary Train, Lieut. Frank N. Stiles, Grand Junction.

CONNECTICUT

To Fort Benjamin Harrison for a course of instruction, Lieut. Philip W. Place, New Haven.

To Fort Riley for a course of instruction, Capt. Arthur B. Landry, Hartford.

To Rockford, Ill., Camp Grant for duty, Lieut. Harold S. Arnold, New Haven.

DELAWARE

To Fort Oglethorpe for a course of instruction, Lieuts. Joseph Bringhurst, Harrington; Joseph M. Barsky, Wilmington.

DISTRICT OF COLUMBIA

To Fort Benjamin Harrison for a course of instruction, Lieut. Timothy J. Sullivan, Washington.

To Fort Des Moines, Iowa, for duty, Lieut. Arthur L. Curtis, Washington.

To Fort Oglethorpe for duty, Lieuts. Arthur G. Compton, for a course of instruction, William H. Littlepage, John B. Piggott, Washington.

To Washington, Capt. Edwin R. Hodge, Washington.

FLORIDA

To Camp Wheeler, Macon, Ga., Lieuts. H. F. Horne, A. C. Koon, Jacksonville; A. M. Ames, Pensacola.

To Fort Monroe, Va., for duty, Lieut. William G. McKay, Jacksonville.

To Fort Oglethorpe for a course of instruction, Capts. Edward G. Birge, Herbert O. Black, Jacksonville; Lieuts. Heber P. Newman, Bartow; George W. Dupree, Blue Creek; Jonathan S. Coker, Gardner; Albert E. Acker and Gaston Day, Jacksonville; Harry C. Galey, Key West; John M. Whitfield, Malone; Wallace P. Crigler, Ocala; Daniel M. Adams, Panama City; John T. Bradshaw, San Antonio; Bennett A. Burks, Titusville; George S. McClellan, Wellborn; Kenneth McC. Davis, Westbay.

To Santa Fe, N. M., Major Frank E. Artaud, Key West.

GEORGIA

To Camp Hancock, Augusta, Capt. Montague L. Boyd, Atlanta.

To Camp Shelby, Hattiesburg, Miss., Lieut. J. H. Johnson, Columbus.

To Fort Benjamin Harrison for course of instruction, Lieut. Henry Grady Banister, Gainsville.

To Fort Des Moines, Iowa, for duty, Lieut. John H. Williams, Pelham.

To Fort Oglethorpe for a course of instruction, Capt. Melton D. Council, Macon; Lieuts. Harold I. Reynolds, Athens; James T. Calloway and Welburn A. Upchurch, Atlanta; John W. Oden, Blackshear; John H. Terrell, Jr., Canon; Ira C. H. Garst, Carrollton; Jesse M. Anderson, Columbus; James W. Anderson, Gray; Charles C. Middleton, Savannah; Lucius P. Farmer, Spread; Rufus E. Graham, Stillmore; Thomas E. Blackburn, Swainsboro; Horace E. Crow, Talmo.

To Syracuse, N. Y., with infantry brigade to complete the medical personnel, Lieut. William G. Herrington, Nunez.

IDAHO

To Fort D. A. Russell, Wyo., for duty, Capt. Edward E. Maxey, Boise.

To Fort Riley for a course of instruction, Lieut. Burrell O. Railston, Rathdrum.

ILLINOIS

To Chicago, Lieut. Alford E. Budde, North Chicago. For duty in the office of the department surgeon, as head of tuberculosis examining board, Lieut. Walter W. Hamburger, Chicago.

To Fort Benjamin Harrison for instruction, Capt. Otis Hackett Johnson, Quincy.

To Fort Des Moines for duty, Lieut. George L. Samuels, Alton.

To Fort Oglethorpe, Lieuts. Ira W. Ellis, Murphysboro, and James Emmons, Pinkstaff.

To Fort Riley for instruction, Lieuts. Willard P. Earngey, Argyle; Charles W. Monroe, Arthur; Rollen W. Harrod, Avon; Harry I. Stevens, Ashley; Frank O. Kunz, Beardstown; Carl F. Lewis, Brussels; Louis D. Hughes, Carbondale; Andrew J. Aird, Carterville; Capt. Francis M. Edwards, Centralia; Capts. Russsell E. Adkins, Walter H. Allport, William B. McCauley; Lieuts. Oliver E. Alyea, W. F. Bartlett, Harry B. Bernhardt, Jesse F. Boone, Lewis L. Brodsky, Edward A. Brucker, Alexander W. Burke, Charles W. Colebaugh, John W. Cornell, Vernon M. Jared, John M. Krasa, Lewis H. Lippemann, Albert Martin, William C. Meachan, Herbert V. Mellinger, Earl B. Miller, Ellis Van Order Moulton, Edward T. Robinson, Lambert W. Rosenbaum, Jerome F. Strauss, John F. West and Eugene P. Wright, Chicago; August C. Armbruster, Collinsville; John G. Dwyer, Cullom; Knud Hartnack, Downers Grove; Joseph C. Kaczowski, Dunning; Walter W. Boyne, East St. Louis; Norton W. Bowman, Flora; Hugh Q. Allison, Grayville; Edward W. Cummins, Charles M. Fuson, Douglas A. Lehman, Robert B. Nyberg, Harrisburg; Lesier W. Baker, Herrin; Capt. Robert R. B. Jacks, Highwood; Lieuts. Harlan W. Brink, Hopedale; Reuben A. Moffett, Ladd; Capt. William E. Chapman, Leland; Lieuts. Gustave A. Floreth, Mount Olive; Charles K. Barclay, New Lenox; David A. Morgan, Nilwood; Albert L. Alderson, Pana; Clifford C. Wehn, Penfield; John L. Aleshire, Plainville; Ralph McReynolds, Quincy; Arthur D. Jackson, River Forest; Daniel E. Egan, St. Charles; John B. Hazel, Jr., Staunton; George J. Powers, Streator; Archie S. Horn and Roy H. Wilson, Tampico; Paul R. Allyn and Walter H. Allyn, Waverly, and Frank W. Blatchford, Winnetka.

To Fort Sheridan, Lieut. Charles D. Eldred, Chicago.

To Rockford, to Camp Grant for duty, Lieut. Edwin F. Hirsch, Chicago.

To Syracuse, N. Y., with infantry brigade to complete the medical personnel, Lieuts. Bernard P. Conway, Chicago, and Samuel R. Magill, Loami.

INDIANA

To Fort Benjamin Harrison for a course of instruction, Lieuts. Henly Harvey, Boswell; Miles Frederick Daubenheyer, Butlerville; Carl L. Souders, Columbia City; Wilcox G. Thorne, Columbus; O. A. Tucker, Daleville; Samuel R. Laubscher, Evansville; Harry C. Odell, Farmersburg; Walgo Clay Farnham and Elmer C. Singer, Fort Wayne; Brant E. Lemmon, Greencastle; John Clay Glackman, Hatfield; Ray H. Thomas and Joseph F. Ward, Indianapolis; John C. Webster, Lafayette; James L. Walker, La Fontaine; Noah Webster Clark, Roseville; Charles E. Stone, Shoals; Lyman Ambrose Burnside, Terre Haute; Malcolm Brown Fyfe, Wheatfield.

To Fort Des Moines, Iowa, for duty, Lieut. Joseph H. Ward, Indianapolis.

To Fort Oglethorpe for a course of instruction, Lieuts. Wallace Curtis Dyer, Evansville; James A. Sims, Pinevillage.

To Fort Riley for a course of instruction, Capt. George W. Newell, Peru; Lieuts. Smith A. Quimby, Indianapolis; Lawrence J. Quillin, Warsaw.

IOWA

To Fort Des Moines for duty laboratory work at Camp Dodge, Lieut. D. J. Glomset, Des Moines.

To Fort Benjamin Harrison for instruction, Lieut. Aaron Clyde Conaway, Marshalltown.

To Fort Oglethorpe for a course of instruction, Capt. Charles L. Marston, Macon City; Lieut. Samuel J. Lewis, Columbus City.

To Fort Riley for a course of instruction, Capts. George C. Skinner, Cedar Rapids; LeRoy A. Wescott, Cherokee; Edwin A. Merritt, Council Bluffs; James W. Osborn, Des Moines; Clarence Van Eppe, Iowa City; Arthur A. Pace, Toledo; Fordyce H. McCabe, Wellman; Lieuts. Paul F. Guernsey, Bloomfield; Roy C. Alt, Cedar Rapids; Leo C. Kuhn, Chariton; Clifford L. Bartlett, Clinton; Harry L. Bridgmann, Columbia; Frederick H. Lamb, Davenport; Alfred S. Price, Des Moines; William S. Binford, Dixon; John R. Christensen, Eagle Grove; Walter E. Anthony, Ottumwa; Garner F. Parker, Pocahontas; William H. Clary, Prescott; J. Willard Caldwell, Steamboat Rock; Otis P. Morganthaler, Templeton; Sylvanus W. Corbin, Willerton.

KANSAS

To Fort Oglethorpe for a course of instruction, Lieuts. Eugene J. Froderick, Dodge City; Felix Cohen, Kansas City.

To Fort Riley for instruction, Capt. James Clyde Butler, Stafford; Lieuts. Ralph C. Henderson, Erie; Tartlon A. Hood, Garnett; Walter N. Mundell, Hutchison; Shirley F. Boyce, Iuka; James B. Donnell, Kinsley; Arthur Knisely, Liberal; Hugh B. Hawthorne, Palmer; Clyde L. Appleby, Peabody; Charles S. Adams St. John; Charles M. Fitzpatrick, Salina; James A. Hampton Webb, Strafford; George K. Purves, Wichita.

To Syracuse, N. Y., with infantry brigade to complete the medical personnel, Lieut. Ralph H. Hertzler, Newton.

KENTUCKY

To Camp Fremont, Palo Alto, Calif., Lieut. R. M. Jones, Louisville.

To Fort Benjamin Harrison for a course of instruction, Lieut. Albert Earle Holmes, Louisville.

To Fort Oglethorpe for a course of instruction, Capts. Orrin LeR. Smith, Lexington; Richard Woods Ogilvie, Princeton; Charles M. Gower, Trenton; Lieuts. Albert C. Bond and Smithfield Keffer, Ashland; Ernest E. Archer, Auxier; Frank I. Buckner, Campbellsville; John P. Wheeler, Carrollton; Stanley E. Straube, Edgoten; E. C. Brandon, Elizabethtown; Henry T. Alexander, Fulton; William A. Weldon, Hardyville; Lon B. Moremen, Irvington; Logan Felts, Lewisburg; Julian T. McClymonds, Lexington; Charles W. Stroup, Ludlow; Marshall A. Moore, McVeigh; Adam G. Osborne, Myra; William W. Anderson, Newport; William E. Ray, Staub.

To Fort Riley for instruction, Lieut. Walter L. Coolidge, Louisville.

To Fort Thomas, Lieut J. B. Robards, Harrodsburg.

To report to Major B. Dewey, San. Corps, Medical Supply Department, New York City, Lieut. F. L. Eiseman, Louisville.

LOUISIANA

To Camp Beauregard, Alexandria, La., Lieuts. T. B. Cracroft, Kelly; R. P. Evans, Newellton; A. A. Landry, Plaquemine; A. T. Palmer, Yelgar.

To Fort Oglethorpe for a course of instruction, Capt. Dalton H. Trepagnier, Burrwood; Daniel O. Willis, Leesville; Nicholas K. Edrington and Solon R. Humphries, New Orleans; James C. Sartor, Rayville.

To Fort Sam Houston, Camp Kelly, South San Antonio, duty with Thirty-Third Aero Squadron, Lieut. O. B. Kiel, New Orleans.

To Syracuse, N. Y., with infantry brigade to complete the medical personnel, Lieuts. Marvin Cappel, Alexandria; Jack T. Cappel, New Orleans; Claude A. Martin, Welsh.

MAINE

To Allentown, Pa., for duty, Lieut. Frank H. Jordan, South Portland.

To Fort Benjamin Harrison for instruction, Capt. Lester Adams, Bangor; Lieuts. Leon S. Lippincott, Brunswick; James McFayden, Milo.

To Fort Riley for instruction, Capt. Arthur U. Desjardins, Waterville; Lieut. Frank W. Merritt, Jay.

MARYLAND

To Camp Doniphan, Fort Sill, Okla., Lieut. P. R. Brown, Baltimore.

To Camp Sheridan, Montgomery, Ala., Lieut. Eugene H. Hayward, Baltimore.

To Camp Wadsworth, Spartanburg, S. C., Capt. Thomas B. Conrad, Chevy Chase.

To Fort Benjamin Harrison for instruction, Lieut. Thomas B. Johnson, Frederick.

To Fort Oglethorpe for a course of instruction, Major George A. Stewart; Lieuts. Everett LeC. Cook, Charles M. Harmon, Charles L. Joslin, Baltimore; Frank M. Wilson, Cumberland; Philip J. Bean, Jarboesville; Edward C. J. Miller, Kitzmiller; Ira M. Zimmerman, Williamsport.

To Fort Riley for instruction, Lieut. Walter C. Burket, Baltimore.

MASSACHUSETTS

To Cambridge, to Harvard for duty, Lieut. Raymond P. Parker, Winthrop.

To Fort Benjamin Harrison for instruction, Capt. Willard Stephen Parker; Lieuts. Henry Manning Emmons and John Hammond Anderson, Boston; Joseph Simpson, Essex; Wilfrid T. LaFortune, Fitchburg; Charles Francis Canedy, Greenfield; Oscar L. Spencer, Lynn, John J. Kelly, Marlboro; Edward S. Ward, North Attleboro; Harry A. Schneider, Pittsfield; Charles Henry Davis, S. Hamilton and John F. Streeter, Springfield; Andres J. McGraw, Taunton; Roland S. Newton, Westboro, and Victor Anthony Aimone, Winchester.

MEXICO

To Camp Cody, Deming, N. M., Lieut. Charles C. Cooke, Vera Cruz.

MICHIGAN

To Army Medical School, Washington, D. C., for instruction, Lieut. Henry Cook, Flint.

To Fort Benjamin Harrison for instruction, Capts. Hugh McDowell Beebe, Ann Arbor; James H. McCall and Robert Albert Carl Wollenberg, Detroit; Edwin James Evans, Greeland; Matthew Kollig, Saginaw; Lieuts. Esli T. Morden, Adrian; Howard Morton Holcombe, Ann Arbor; Ralph Ernest Dawson, Blanchard; Sheldon B. Young, Caseville; Robert E. Hayes, Channing; Allan M. Wilkinson, Charlevoix; Wilber Aaron Griffith, Coldwater; Clarence Herbert Belknap, Edmund William Bolio, Ralph Hugh Bookmyer, Edward Kanter, Curenus B. Lockwood, Robert M. Martin, Robert C. Moehlig, Harrold L. Morris, Grover C. Pemberthy, William L. Sherman and Harold Wilson, Detroit; Raymond M. Schulte, Dollar Bay; Victor Henry de Somoskeoy, Flint; Wells C. Reid, Grand Blanc; Burt Francis Green, Hillsdale; Ray R. McCrum, Lansing; Arthur J. Warren, Mount Clemens; Ira Arthur Abrahamson, Negouinee; George P. Sackrider, Owosso; Lester F. Kennedy, Pontiac;

Fred P. Nevius, Posen; John Lindsay Conover, Rapid River; Walter Alexander DeFoe, Saginaw, and Joseph L. Murphy, Taunton.

To Fort Oglethorpe, Lieut. Warren E. Anderson, Jackson.

To Fort Snelling, Minn., for duty with Forty-First Infantry as surgeon, Capt. Warren P. Morill, Benton Harbor.

To Report by Telegraph to Commanding General, Southern Department for duty, Capt. Frank S. Love, West Branch.

To Washington, Lieut. Warren L. Babcock, Detroit.

The resignation of Lieut. William R. Manlove, Grand Rapids, is accepted.

MINNESOTA

To Deming, N. M., Lieut. Gilbert J. Thomas, Minneapolis.

To Fort Riley for instruction, Capt. Edward A. Meyerding, St. Paul; Lieuts. Ronald L. Laney, Brown Valley; Roderick F. McHugh, Coltraine; Ralph B. Bettman, Rochester; Frank A. Plum, Rochester, and Harry E. Canfield, Willmar.

To Fort Sheridan for duty, Lieut. George D. Rice, St. Cloud.

MISSISSIPPI

To Camp Cody, Deming, N. M., Lieut. Little B. Neal, Jackson.

To Camp Shelby, Hattiesburg, Miss., Capt. H. L. Noel, Lexington; Lieuts. A. T. Graham, Eastman, and H. P. Boswell, New Albany.

To Fort Benjamin Harrison for instruction, Lieut. Paul Zollicaffer Browne, Jackson.

To Fort Des Moines for duty, Lieut. James A. Owen, Natchez.

To Fort Oglethorpe for a course of instruction, Capt. Walter R. McKinley, Columbus; John T. Barbee, Ripley; Lieuts. Judge James, Ackermore; James Q. Fountain, Bay St. Louis; Rufus E. Priest, Buena Vista; Thomas J. Bush, Clarksdale; William J. Lusk, Cliftonville; George H. Spivey, Hollandale; William G. Byrd, Isola; William S. Cranford, John F. Scarborough and Charles P. Clark, Laurel; Rufus E. Applewhite, Magnolia; Robert M. Leigh and Osee Fulton Kean, Meridian; Grover C. Denson, Oak Vale; Emile Q. Withers, Jr., Okalona; William H. Strahan, Polar Creek; Solomon R. Boykin, Puckett; Shelby C. Spencer, Shannon, and George C. Jones, Yazoo City.

MISSOURI

To Camp Kearney, Linda Vista, Calif., Capt. R. Smart, Crane.

To Camp Shelby, Hattiesburg, Miss., Lieut. F. M. Cook, St. Louis.

To Camp Sheridan, Montgomery, Ala., Capt. Ernest G. Mark, Kansas City.

To Camp Wheeler, Macon, Ga., Lieut. W. S. Armour, Kansas City.

To Fort Oglethorpe, Lieuts. Albert L. Evans, Bonne Terre, and Devilla D. Edmons, Kansas City.

To Fort Riley for instruction, Capts. Edward H. Clark, Kansas City; Walton F. Fry and Waldemar Ude, St. Louis; Clive S. McGinnis, Sedalia; Lieuts. Fred C. Albright, Bronaugh Paul R. Williams, Cape Girardeau; Buell F. Menefee, Jonesburg; William F. Culbertson, Zachariah G. Jones, Ward H. Leonard and Harvey E. McCarthy, Kansas City; Hilen K. Wallace, St. Joseph; Joseph T. Axline, Fred LeG. Gibbs, Edward E. Heiple, Martin F. Kouri and Arthur J. Zimlick, St. Louis, and Samuel D. Avery, Troy.

To Presidio of San Francisco for duty with Provisional Sanitary Train, Capt. Frank D. Dickson, Kansas City.

MONTANA

To Fort Benjamin Harrison for instruction, Lieut. Edwin James Greer, Great Falls.

To Fort Riley for instruction, Lieut. Lindsay W. Baskett, Big Timber.

NEBRASKA

To Fort Benjamin Harrison, Lieut. James M. Woodard, Aurora.

To Fort Riley for instruction, Capts. Charles H. Campbell, Columbus; John Buis, Pender; Frank S. Nicholson, St. Paul; Lieuts. Edgar Cline, Auburn; Charles E. Legg, Champion; William O. Akers, Florence; Lothar F. Egen and Charles F. Shook, Omaha; William H. Crawford, Rushville, and Charles P. Brenn, Western.

NEW HAMPSHIRE

To Fort Benjamin Harrison, Lieuts. Leopold T. Togus, Hookset; Winfred Oren Brown, Littleton, and John B. Warden, Whitefield.

Honorably discharged, Lieut. William M. Robb, Keene.

NEW JERSEY

To Allentown, Pa., for duty, Capt. George H. Lathrope, Morristown.

To Camp Hancock, Augusta, Ga., Lieut. Livingstone L. Lewis, Hoboken.

To Camp Wadsworth, Spartanburg, S. C., Lieut. George W. Vannatta, East Orange.

To Fort Benjamin Harrison for instruction, Lieuts. Max E. Stern, Jersey City; Benjamin D. Ruben, Trenton.

To Fort McPherson, Lieut. William L. Vroom, Ridgewood.

To Fort Oglethorpe for a course of instruction, Capt. George C. Albee, South Orange; Lieuts. David Berner and Samuel L. Salasin, Atlantic City; John W. Boggs, Atlantic Highlands; Millard F. Sewall, Bridgeton; Philip DuB. Bunting, Elizabeth; Harvey S. Brown, Freehold; Frank Bortone, Jersey City; Ralph R. Charlesworth, Millville; Maurice S. Avidan, Robert Buermann, Ernest Gennell, James E. McCormick, Raymond J. Mullin and Frank W. Pinneo, Newark; Anthony Gruessner, New Brunswick; Charles S. Smith, Orange; William A. Brady, Union Hill; William T. Callery, Weehawken.

To Fort Ontario, N. Y., in connection with Hospital Unit N., Capt. Arthur F. Thompson, East Orange; Lieut. Maxwell G. Keeler, Weehawken.

To Fort Riley for instruction, Lieuts. John T. Rose, Asbury Park; Charles S. Brady, Union Hill.

To Washington, Walter Reed Hospital, Lieut. Charles N. Harper, Trenton.

NEW MEXICO

To Fort Benjamin Harrison for a course of instruction, Lieut James A. Van Horne, Roswell.

To Fort Riley for a course of instruction, Lieut. John W. Tinder, Roswell.

NEW YORK

To Army Medical School, Washington, D. C., for instruction, Lieuts. Burke C. Hamilton, Goshen; Ralph E. Costanzo, New York.

To Camp Beauregard, Alexandria, La., Lieut. D. O. Sherman, Brooklyn.

To Camp Green, Charlotte, N. C., Lieut. W. M. Scruggs, New York.

To Camp Hancock, Augusta, Ga., for duty, Lieut. Joseph G. Yocum, New York.

To Camp Sevier, Greenville, S. C., Lieut. J. L. Bryson, New York.

To Fort Adams, R. I., for duty with Provisional C. A., Lieut. John K. Johnston, Madison Barracks.

To Fort Benjamin Harrison, for instruction, Capts. George Francis Wilklow, Allenville; Herbert Cerda de Vilarrestan Cornwall, Harold M. Hays, Gustave Randolph Manning, New York; Eugene Francis Connally, Troy; Stephen Warner Perry, Warwick; Lieuts. Forest R. Mildrew, Auburn; Hubert Emile Chauvin, Brentwood; James Hayes Blakeney, William G. Phillips, Jr., Brooklyn; Geoffrey Charles Henry Burns, Central Islip; Walter L. Weeden, Clifton Springs; Harvey Columbus Hardegree, Flushing; George John Geisler, Hempstead; Victor Gabriel Bourke, Livingston Manor; George Augustine Green, Mechanicsville; John Francis Holden, New Rochelle; Valentine Collamer Baker, Edward Martin Bernecker, Edward Guilford Cary, Henry Arthur Cassebeer, James Joseph Fitzgerald, Maximilian Frick, Lewis Greenberg, Samuel Greenfield, Albeon O. Jimenis, Lipman M. Kahn, John J. Lancer, Philip J. Lipsett, Henry M. Moore, William A. Murphy, Joseph E. Raia, Joseph Schapiro, New York; Raymond Samuel Barry, John Lewis Bishop, Francis J. Talbot, Niagara Falls; Clarence Albert Greenleaf, Olean; Leo J. Ward, Ossining; Rupert Vincent Gibbons, Oyster Bay; Leon James Barber, Benjamin Harrison Dike, Paul M. Parker, Rochester; George Warren Beebe, St. Johnsville; George Byron Brown, Saratoga Springs; Garrett Marcellus Clowe, Waldron A. Stearns, Claude W. Walker, Schenectady; Charles A. Joy, Sonyea; William B. McKeon, Troy; John Elywn Cochrane, Valatie; Watson A. Lawrence, Valhalla; Robert E. Plunkett, Whitehall; Lowill T. Genung, Worcester; Benjamin Harrison Betts, Yonkers.

To Fort Ethan Allen, Vt., for duty, Lieut. Leo G. Weishaar, Mount Vernon.

To Fort Oglethorpe, for a course of instruction, Capt. Harry R. Stone, Lieuts. William V. Healey, New York; Frank W. Schwartz, Springvalley.

To Fort Ontario, N. Y., for duty with hospital Unit N., Major Ralph A. Stewart, Capt. Milton Bodenheimer, Lieut. Donald E. Brace, New York.

To Fort Slocum, N. Y., for duty, Lieuts. Benjamin F. Van Duzee, Holland; William C. McKnight, New York.

To Fort Royal, Va., Capt. G. Draper, New York.

To New York, General Hospital No. 1, Lieut. Norman E. Titus, New York.

To Syracuse, N. Y., for duty, Capt. Archer D. Babcock, Syracuse.

To Takoma Park, D. C., for duty, Capt. Erastus Corning, Albany.

To Washington, D. C., for duty, Major Warfield T. Longcope, Lieuts. Linsly R. Williams, to Walter Reed Hospital, Wilbur W. Stearns, New York.

NORTH CAROLINA

To Camp Green, Charlotte, N. C., Capt. J. H. Way, Waynesville; Lieuts. S. H. Lyle, Franklin; G. Wilkes, New River; H. Robinson, Reidsville.

To Camp Sheridan, Montgomery, Ala., Capt. Everett A. Lockett, Winston Salem; Lieut. Julius N. Hill, Murphy.

To Camp Wadsworth, Spartanburg, S. C., Major John T. Burrus, High Point; Marvin L. Smoot, Fayettesville.

To Fort Oglethorpe, for a course of instruction, Lieut. Jasper N. Anderson, Albemarle; Percival R. Bennett, Bryson City; L. Dowe Floyd, Cerro Gordo; Herbert P. Moseley, Farmville; Edmund J. Bryson, Fontana; Darius C. Absher, Henderson; Frederick O. Swindell, Kittrell, Laurie J. Arnold, Lillington; William D. McLelland, Mooresville; Noah B. Adams, Murphy; Daniel F. Patchin, Roanoke Rapids; James A. Dimmette, Wallburg; Baird U. Brooks, West Durham.

NORTH DAKOTA

To Fort Riley, for instruction, Capt. Bernard S. Nickerson, Mandan; Lieuts. Julius O. Arnson, Bismarck; Orville N. Meland, Grand Forks; William Ginsberg, Omemee.

OHIO

To Camp MacArthur, Waco, Texas, Lieut. James W. Henry, Berlin Cross Roads.

To Columbus Barracks, Ohio, Lieut. John A. Rhiel, Malvern.

To Fort Benjamin Harrison, for instruction, Lieut. Otho J. Powell, Ashland; Emmett Lorenzo Hooper, Athens; Arthur J. McCracken, Bellefontaine; John Tipton Gibbons, Celina; Martin H. Urner, Charles H. Weintz, Henry L. Woodward, Cincinnati; Abraham Benjamin Grossman, Ignatius Edward Jasinski, Daniel M. MacDonald, Norman P. McGay, Emil E. Wolf, Cleveland; Wilmer E. Griffith, Hamilton; Julius Ralph Bolles, Holgate; John R. Johnson, Lima; Jacob Meyers Heyde, Loudonville; Wayne P. Macklem, Mansfield; Lee Edward Casey, Minerva; John Redman Claypool, Carroll Durham Conrad, Mount Vernon; William Harris Ambrose, New Petersburg; George P. Tyler, Jr., Ripley; Timothy G. Sellew, Watertown; Theodore J. Kasinski, Youngstown.

To Fort Oglethorpe, for instruction, Lieut. Albert B. Martin, Blanchester.

OKLAHOMA

To Camp Doniphan, Fort Sill, Okla., Capt. Benjamin H. Brown, Muskogee; Lieuts. W. P. Sims, Drumright; J. A. Walker, Fleetwood; D. S. Lee, Guymon; N. W. Campbell, Poteau.

To Camp MacArthur, Waco, Texas, Lieuts. Robert E. Calhoun, Hallett; Sims D. Bevill, Poteau.

PENNSYLVANIA

To Army Medical School, Washington, D. C., for instruction, Lieuts. John J. Caffrey, Harry C. Fish, William P. Mull, Philadelphia, and Burns S. Chaffee, Pittsburgh.

To Camp Hancock, Augusta, Ga., Lieuts. George M. Laws and Thomas L. O'Drain, Philadelphia.

To Camp MacArthur, Waco, Texas, Capt. Henry K. Gaskill, Philadelphia.

To Camp Sheridan, Montgomery, Ala., Lieut. Floyd D. Lohr, Derry.

To Camp Wadsworth, Spartanburg, S. C., Capt. Stillwell C. Burns, Philadelphia.

To Columbus Barracks, Ohio, Lieut. Lauren C. Thomas, Latrobe.

To Fort Benjamin Harrison, for instruction, Capt. Ernest Marsters Vaughan, Rayersford; Lieuts. Richard J. Miller, Robert D. Scott, Philadelphia; John H. Murray, Punxsutawney, and John C. Lee, Rummerfield.

To Fort Des Moines, for duty, Frank E. Boston, Philadelphia.

To Fort Ethan Allen, Vt., Lieut. Samuel McClary, Philadelphia.

To Fort Oglethorpe, for instruction, Capts. William C. Heisey, McKeesport; Sydney K. Fenollosa, Pittsburgh; Peter H. Dale, State College; Lieuts. Walter E. Lange, Allentown; David Kaufman, Altoona; Frank L. Baum, Athol; Clarence F. Bernatz, Braddock; Frank L. Knox, Claysville; Lever F. Stewart, Clearfield; Alvin Z. Stoner, Cumberland Valley; Almon C. Hazlett, Dunmore; John E. Belding, Joseph E. Budenhoefer, Carl B. Lininger, Joseph A. Stackhouse, Erie; George L. Brown, Fort Hunter; Harry Gallagher, Glen Olden; Hugh B. Barclay, Greensburg; William D. Cleland, Harlansburg; Robert H. Eshleman, George B. Kunkel, Clark S. Long, Harrisburg; Joseph C. Kochczynski, Hazleton; Harry J. Treshler, Homestead; Jacob J. Schwegler, Kennett Square; Raymond C. Fagley, Kulpmont; Joseph J. Bellas, Lansford; Alfred D. Strickler, Lebanon; Charles M. McCoy, Lewistown; Nathaniel G. Shafritz, Mont Alto; Frederick B. Allen, North Wales; John J. Bendick, Olyphant; Chester LeR. Barry, Oxford; Joseph J. Austra, James H. Baldwin, Frank D. Baumann, Franklin D. Benedict, Albert P. Berg, Charles A. Bigler, Jr., Lawrence L. Blackburn, Benjamin Bowman, Clarence D. Bradley, John W. Bransfield, Frank A. Bridgett, Alexander J. P. Conlen, Joseph R. Criswell, William H. Crowley, Arthur M. Dannenberg, Richard S. Davis, Amos K. DeBell, Jacob L. Engle, Donald R. Ferguson, Charles B. Hollis, Clarence W. Judd, I. Warner Knight, William J. MacMurtrie, Samuel McClary, James W. McMonagle, Richard L. McNeer, Stirling W. Moorhead, John P. O'Brien, Albert Pilkington, William C. T. Poulson, George M. Purves, Percy H. Shaw, James E. Talley, Morris C. Thrush, Harry E. Ungerleider, Philadelphia; Samuel J. Marks, Philipsburg; Clarence J. Buck, Wallace Bulford, Edward Graver, Benjamin Weiner, Pittsburgh; James E. Dwyer, Polk; Samuel A. Leinbach, Quakerstown, Walter M. Bertolet, John G. Knauer, Addison M. Rothrock, Reading; Samuel B. Gray, Scottsdale; Harvey B. Cornell, William J. L. Davis, William J. O'Malley, Frank R. Wheelock, Scranton; Leo T. Mullahey, Shenandoah; Jesse L. McCracken, Smithfield; James A. Buchana, Strickersville; Samuel A. Baltz, Uniontown; Henry A. Rothrock, Westchester; Augustine J. Mulligan, White Haven; Francis L. Alexaitis, John W. Cressler, William J. Doyle, Wilmer C. Dreibelbies, Cyrus Jacobosky, Thomas V. McLaughlin, Leo C. Mundy, Robert H. Murdock, Wilkes-Barre, and Benjamin H. Patterson, Wilkinsburg.

To Fort Slocum, N. Y., Lieut. Frank N. Greene, Philadelphia.

To Governors Island, N. Y., for duty, Capt. James T. Madden, Pittston.

To Rockford, Ill., to Camp Grant for duty, Lieut. Allen H. Moore, Philadelphia.

To Spartanburg, S. C., for duty, Capt. Sigmund L. Gans, Philadelphia.

To Syracuse, N. Y., with infantry brigade to complete the medical personnel, Lieut. Melbourne J. Pond, Warren.

PHILIPPINE ISLANDS

Honorably discharged, Capt. George B. Angle, Manila.

RHODE ISLAND

To Camp Kearney, Linda Vista, Calif., Lieut. J. G. Norman, Providence.

To Fort Ethan Allan, Vt., for duty, Lieut. Richard Metcalf, Providence.

To Fort Ontario, N. Y., with Hospital Unit N., Lieut. Robert H. Whitmarsh, Providence.

SOUTH CAROLINA

To Camp Sevier, Greenville, S. C., Capt. C. B. Earle, Greenville; Lieuts. A. B. Weathersbee, Belton; E. W. Pressly, Clover; C. B. Geiger, Manning.

To Fort Oglethorpe, for instruction, Lieuts. Fitzhugh P. Salley, Buffalo; John C. Wieters, Charleston; John R. Claussen, Claussen; Lindsay Peters, Columbia; James A. Norton, Conway; Oscar A. Alexander, Andrew T. Baird, Darlington; William J. Burdell, Lugoff; Dalmar R. Blakeley, Mauldin; Frank D. Mower, Newberry; William B. Ackerman, Walterboro.

SOUTH DAKOTA

To Fort Riley, for instruction, Lieuts. Frederick O. Kaps, Britton; Glenn V. Sigler, Highmore.

TENNESSEE

To Camp Bowie, Fort Worth, Texas, Lieut W. Hibbetts, Nashville.

To Camp Logan, Houston, Texas, Capt. J. M. Ballew, Memphis.

To Fort Oglethorpe, for instruction, Lieuts. Joseph P. Delaney, Arrington, David T. Austin, Bogota; Victor H. Miller, Bolivar; Nicholas Ardan, Bristol; Benjamin C. Arnold, Jackson; Llewellyn M. Dykesk, Johnson City; Ludlow Lambain, Knoxville; Edgar S. Turner, Lafollette; Sam W. Donaldson, Maryville; Clarence A. Bell, Kinsey M. Buck, Max Kaplan, Lawrence L. Keller, Memphis; William R. Arrants, Thurman B. Civan, Nashville; Robert L. Dossett, Tullahoma; Daniel L. Haggerty, Unionville; Thomas W. Rhodes, Whiteville.

To Fort Riley for instruction, Lieut. Benjamin G. Allen, Chattanooga.

TEXAS

To Ambulance Company No. 12, Capt. Paul N. Bowman, San Antonio.

To Camp Bowie, Fort Worth, Texas, Lieut. G. A. Deason, Henderson.

To Camp Cody, Deming, N. M., Capts. Thomas C. Brooks, Bay City; Joseph S. Jones, Galveston; Ernest H. Hamilton, Kilgore.

To Camp Hancock, Augusta, Ga., Lieut. Knight W. Field, Dallas.

To Camp Logan, Houston, Texas, Capt. G. A. McBride, Harlingen; Lieuts. J. E. Cooke, Mart; W. P. Barton, Overton.

To Camp MacArthur, Waco, Texas, Lieuts. Robert M. Prather, Beeville; Harry D. Nifong, Britton.

To Camp Wadsworth, Spartanburg, S. C., Lieut. Robert L. Dinwiddie, San Antonio.

To Fort Benjamin Harrison, for instruction, Lieut. Lewis William Fetzer, Dallas.

To Fort Bliss, Major Frederick H. Mills, Fort Bliss.

To Fort Riley for instruction, Lieut. Thomas M. Greenwood, Buff Dale.

To Fort Sam Houston, Camp Kelly, South San Antonio, for assignment to Thirty-Fifth Aero Squadron, Lieuts. Charles H. Brownlee, Burnet; Thirty-Fourth Aero Squadron, Edwin R. Townsend, Fredericksburg; Thirty-Seventh Aero Squadron, Herbert L. McNeil, Galveston.

To report by telegraph to commanding general, Southern Department, for duty, Lieuts. Jesse H. Lander, Beeville; Young J. Mulkey, Clifford C. Parrish, Fort Worth; Talmage O. Wooley, Germantown; William O. Williams, Houston; Lucian Nicholson, Paris.

UTAH

To Fort Douglas, Utah, for duty, Capt. William F. Beer, Salt Lake City.

VERMONT

To Fort Benjamin Harrison, for instruction, Lieuts. Charles E. Libbey, Danville; Frank Leslie Gilbert, Grofton; George Lucian Bates, Morrisville.

To Fort Riley, for instruction, Lieut. Frederick E. Clark, Burlington.

VIRGINIA

To Fort Oglethorpe, for a course of instruction, Capt. Howard Fletcher, Fairfax; Lieuts. Bernard Barrow, Barrows Store; William S. Wiley, Bristol; Erik T. Sandberg, Cardinal; Samuel T. Elliott, Danville; Urbane F. Bass, Fredericksburg; Charles A. Young, Gore; James S. Burger, Hopewell; Benjamin B. Dutton, Lot; Otis T. Amory, Newport News; Oliver F. Blankingship, James G. Boisseau, Richmond.

To Fort Riley, for instruction, Lieut. William H. Howard, Hampton.

To Rockford, Ill., Camp Grant, for duty, Lieut. David A. Haller, Pocahontas.

WASHINGTON

To Camp Wheeler, Macon, Ga., Lieut. H. L. Upshaw, Tacoma.

To Fort George Wright, Wash., for duty, Lieut. Nathaniel E. Roberts, Olympia.

To Fort Riley, for instruction, Lieut. John W. Adams, Waterville.

To report by telegraph to the commanding general, Western Department, for assignment to duty, Capt. Herbert C. Liesser, Vancouver; Lieut. John A. Mapes, Index.

To Vancouver Barracks, Wash., for duty, Capt. Herbert C. Leisser, Vancouver.

WEST VIRGINIA

To Fort Benjamin Harrison, for instruction, Capt. John Budd Thompson, Spencer.

To Fort Oglethorpe, for instruction, Lieuts. Atlee Mairs, Charleston; Charles F. McHood, Alderson; John J. Goodwill, Coopers; George F. Grisinger, Gamoca; Dennis J. Cronin, Huntington; Grover C. Roberson, Hurricane; Conrad F. Sayre, Mason; Meriwether L. Anderson, Richmond, and Emerson Megrail, Wheeling.

WISCONSIN

To Fort Riley, for instruction, Capts. Clarendon J. Comos, Oshkosh, and Frederick C. Huff, Sturgeon Bay; Lieuts. Sylvester J. Driessel, Barton; Albert A. Axley, Butternut; Henry B. Beeson, Cornell; Frank J. Hager, Denmark; Louis J. Bennett, Fort Atkinson; William A. Joseph, Hancock; Royal C. Rodecker, Holcombe; Harry J. Burns, Hudson; Frank O. Brunkhorst, Kewaunee; Norman O. Nelson, Madison; Edgar B. Elvis, Medford; Irving Van Vliet Grannis, Menomonie; Gerhard A. Bading, Max Bornstein, and Albert G. Jenner, Milwaukee; John C. Johnson, Ogdensburg; Marlin C. Crane, Osseo; Herbert T. Barnes, Pewaukee; Paul H. Fowler, Plaine; Edgar W. Bedford, Sheboygan; Richard W. A. Dehmel, South Germantown; Edward P. Evans, South Milwaukee; George I. Badeaux, Spooner; Wayne F. Cowan, Stevens Point; Harry A. Keenan, Stoughton; Walter A. McEachern, Superior; Neal S. Simons, Taylor; George R. Baker, Tomahawk; John E. Boland, Two Rivers; Harry E. MacLaughlin, Waupaca; George LeR. Converse, Webster; James C. Tyvand, Whitehall; Charles C. Rowley, Winnebago.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ILLINOIS

Whooping Cough.—The health commissioner of Winnetka reports that there have been forty-six cases of whooping cough in that suburb, with two deaths.

Infantile Paralysis.—During the week ending August 18, sixteen cases of infantile paralysis were reported to the state department of health, seven of which were outside of Chicago.

Personal.—Dr. Howard T. Child, Kankakee, has been elected pathologist to the State Hospital for the Insane, Norristown, Pa.——Dr. Cyrus H. Anderson, McLeansboro, recently appointed superintendent of the Anna State Hospital, has sold his newspaper, the *Leader*.——Major Herman H. Tuttle, M. C., Ill. N. G., Springfield, has been appointed sanitary inspector of Camp Logan, Houston, Texas.——Drs. Frank P. Norbury, Springfield, and Edwin C. Hayes, Urbana, have been appointed members of the state board of public welfare commissioners.

Chicago

Personal.—Dr. Emil C. Dudley has been appointed a member of the state board of public welfare commissioners.—— Dr. John L. Porter has been appointed a member of the commission on military orthopedics.

Graduate Lectures.—Major G. Seelig, professor of surgery in the St. Louis University, recently delivered a lecture on "Shock," and Dr. Bennet M. Allen, professor of zoology in the University of Kansas, an address on "Experiments on the Glands of Internal Secretion in Amphibian Larvae" before the faculty and students of the graduate summer quarter in medicine of the University of Illinois.

New Appointments at Northwestern.—Northwestern University Medical School announces the following faculty appointments for 1917-1918: Drs. Frederick G. Harris, professor of dermatology and syphilology, succeeding Prof. Joseph Zeisler, who becomes professor emeritus of dermatology; Frank C. Becht, professor of pharmacology, succeeding Prof. Hugh McGuigan; John Ridlon, honorary professor of orthopedic surgery; John L. Porter, professor of orthopedic surgery; Herbert A. Potts, professor of oral surgery; Frank E. Simpson, adjunct clinical professor of dermatology; Charles P. Caldwell, adjunct clinical professor of medicine; Edward L. Moorhead, adjunct clinical professor of surgery.

INDIANA

New Medical School in Indiana.—A letter from the secretary of the University of Notre Dame, Notre Dame, indicates that that university has established a department of medicine which will offer only the first two years of the medical course. Two years of college work are to be required for admission, which, followed by two years of medical work, completes the course for the degree of bachelor of science in medicine.

MARYLAND

Notice from Health Department to Parents.—A bulletin has been issued by the health department requesting parents and guardians to have every child of school age suffering from diseased tonsils, adenoids or defective eyesight treated before entering school in order to prevent an epidemic of infectious diseases.

Personal.—Dr. Alexander D. McConachie, Baltimore, is at his home, convalescent after an operation for appendicitis, performed August 1.——Dr. Henry Barton Jacobs, Baltimore, has been elected governor of the Newport Reading Room for a term of three years.——Drs. William Robert Johnson and Robert William Johnson, Baltimore, twin brothers, received commissions in the Medical Reserve Corps recently.

MISSOURI

Personal.—Dr. Jesse L. Eaton, Bismarck, division surgeon of the Missouri Pacific and Illinois Southern railroads, has been appointed superintendent of State Hospital No. 4, Farmington, and assumed control of the institution, August 1.

Correction.—In THE JOURNAL, August 18, there appeared a notice of the death of Dr. Marcus B. Austin, Brunswick, Mo. The information was derived from a local newspaper, and was premature, as Dr. Austin writes that, although he has been ill with septicemia, he is very much alive and has no present intention of dying.

Health Committee Named.—The chairman of the Missouri Council of Defense has announced the appointment of the following committee on public health: Drs. Raymond C. Shaffer, St. Louis, dean of Washington University Medical School; Guy L. Noyes, Columbia, dean of the University of Missouri Medical School; George H. Jones, Jefferson City, secretary of the state board of health; William T. Coughlin, St. Louis, and Herman E. Pearse, Kansas City.

St. Louis

Personal.—Dr. John S. Young, a member of the Harvard Surgical Unit, who was reported to have been killed, replies, contradicting the rumor of his death, which he says is "Quite wrong."——Drs. John W. Stewart and Herbert S. Langsdorf have been appointed resident surgeons at the City Hospital.——Dr. Harry T. Evans has been appointed house physician for the Missouri State Sanatorium, Mount Vernon.

NEW YORK

New Convalescent Home.—A tract of 550 acres between Peekskill and Oscawanna in Westchester County has been purchased as a site for the Valeria Home for Convalescents, which was founded by the late Jacob Langeloth.

Medical Director Assumes Control.—Dr. Roy L. Leak, superintendent of the Syracuse City Psychopathic Hospital, and professor of medical jurisprudence in the medical department of Syracuse University, has succeeded Dr. William C. Sandy, Jr., resigned, as medical director of the South Carolina State Hospital for the Insane, Columbia.

Compulsory Hospital Law Passed.—The committee on the prevention of Tuberculosis of the New York State Charities Aid Association has been successful in securing an amendment of the county tuberculosis hospital law, whereby the erection of hospitals is mandatory in counties of 35,000 population or more. The new law affects twenty counties, eight of which had previously taken action leading to the establishment of a hospital, but had not yet let contracts; of these, two have already signed contracts for the erection of a hospital. Of the twelve remaining counties which had taken no previous action, eleven have since taken definite steps such as appointment of committees to secure sites, advertising for bids, etc.

New York City

Imprisoned for Draft Plot.—Dr. Samuel J. Bernfeld, a member of Exemption Board No. 99, charged with conspiracy to obstruct the draft laws, is reported to have entered a plea of guilty, and to have been sentenced to two years' imprisonment in the Federal Penitentiary, Atlanta, Ga. The specific charge against the defendant was the acceptance of a bribe from a registrant to exempt him.

School for Crippled and Blind.—New York is to have a Red Cross institute for teaching crippled and blind men to be self-supporting. Jeremiah Milbank has contributed $50,000 for the promotion of this undertaking, and Edward T. Devine of the New York School of Philanthropy has gone to France to study the method of teaching the blind and cripples in the reeducational schools of France.

Rockefeller Releases Funds for Emergency War Work.—Recently it was announced that Mr. John D. Rockefeller had withdrawn the stipulation with reference to the administration of the Rockefeller Foundation, by which he reserved the right to indicate how a portion of the income should be spent. He has now gone a step further, and has decided that in addition to giving the income from the $100,000,000 given the foundation for emergency war work, $10,000,000 of the principal may be drawn on. Already appropriations aggregating $6,426,872 have been made from this draft on the foundation's investments, including $5,000,000 given the Red Cross. The appropriations announced include the Young Men's Christian Association, $100,000 for the same purpose; building and equipping the demonstration war hospital, $300,000, and $100,000 for the Belgian Relief Commission. The International Health Board received $100,000 for combating tuberculosis in France, in connection with the French government, while lesser sums have been given for Asyrian and Armenian relief, for the preparation and distribution of serums to be used in the war

hospital special research in war medicine, and other needs growing out of the war.

NORTH DAKOTA

New State Board.—Drs. Albert W. Skelsey, Fargo; Joseph C. Suter, Grafton, and Alexander J. McCannel, Minot, have been appointed members of the State Board of Medical Examiners.

Personal.—Dr. Gustave L. Rudell has been appointed local surgeon of the Minneapolis, St. Paul and Sault Ste. Marie Railway at Plaza.——Dr. Peter A. Nestos, Minot, has succeeded Dr. Alexander J. McCannel as local surgeon of the Minneapolis, St. Paul and Sault Ste. Marie Railway.

OHIO

Whooping Cough.—The health commissioner of Cleveland announces that there are 1,000 cases of whooping cough in the city and that thirteen deaths have been caused by the disease since February 1.

Physicians' Building Planned.—A sixteen-story building is to be erected at Cleveland which will cost $750,000, and will be used exclusively by physicians and dentists, and dealers in medical and dental supplies.

Cancer Committee Appointed.—The following have been named as a state committee to investigate cancer, and to institute measures whereby the mortality from this cause may be reduced: Drs. Andre Crotti, Columbus; Julius H. Jacobson, Toledo, and Charles E. Holzer, Gallipolis.

The Tuberculosis Conflict.—The Cleveland City Council has been asked for an immediate appropriation of $500,000 to provide a hospital for patients with advanced cases of tuberculosis with accommodation for 350 patients, accommodation for 200 additional patients in the incipient stage, and a nurses' home at the Warrensville Sanatorium.

Personal.—Dr. William K. Ruble, Martinsville, who was recently elected treasurer of Clinton County, has moved to Wilmington.——Dr. John J. McShane, secretary of the board of health of Akron, has resigned to accept a position with the Illinois State Board of Health.——Dr. E. Benjamin Gillette has succeeded Major Dale Wilson as police and fire surgeon of Toledo.——Dr. Claude C. Craig, Urbana, announces that on account of his health he will retire from the practice of medicine.

Hospital Notes.—Differences between the authorities of St. Elizabeth's Hospital, Dayton, and the medical staff of the instution have resulted in the elimination of the maternity ward of the hospital.——The Fountain Park Sanatorium which is under construction in Champaign County will be ready for occupancy this month. The building will have cost, when completed, about $10,000.——Dr. Wilford White, Ravenna, states that on account of ill health he contemplates the permanent closure of the White Hospital.——The Inter-County Tuberculosis Hospital, Chillicothe, which is being built by Fayette, Ross, Pike, Vinton, Pickaway, Clinton and Jackson counties, is now completed and ready for occupancy.

Postgraduate Course at Dayton.—The Second Councilor District branch of the Ohio State Medical Association will hold a medical chautauqua at Dayton, September 24-28. On each day lectures will be given from 9 o'clock until 4, with the exception of one hour which is set apart for lunch. Among the lecturers will be Drs. Charles Emerson, Indianapolis, who will speak on "Internal Medicine and Nervous Diseases"; Dr. Martin H. Fischer, Cincinnati, on "Physiology and Focal Infections"; Dr. Alfred S. Warthin, Ann Arbor, Mich., on "Pathology"; Dr. Isaac A. Abt, Chicago, on "Pediatrics"; Dr. Rudolph W. Holmes, Chicago, on "Obstetrics"; Dr. Edward Carl Rosenow, Rochester, Minn., on "Focal Infections in Relation to Systemic Diseases," and Dr. Carl A. Hamann, Cleveland, on "Surgery."

PENNSLYVANIA

Medical Corps Changes.—The following officers have been commissioned: Lieut.-Col. William E. Keller, Lackawanna County, July 17, assigned to duty with the division; Charles H. Furnee, Armstrong County, assigned Sixteenth Infantry.

Infantile Paralysis.—There have been reported to the state health department from New Castle thirty-four cases of infantile paralysis in a little more than a month. Moving picture theaters have been closed, and children have been prohibited from attending church and Sunday-school services. Thus far nine deaths from the disease have been reported.

Personal.—Dr. David L. Simon, Pittsburgh, has been appointed chief police and fire surgeon, succeeding Dr. D. E. Sable, who is on duty as major in the First Field Artillery. The salary of Dr. Richard G. Burns, acting director of the Pittsburgh Department of Health, has been increased to $7,000.——Dr. John J. Coffman, Scotland, is convalescent after a serious illness.——Dr. Samuel G. Dixon, state health commissioner, Pittsburgh, is under treatment at the White Pine Sanatorium, Chambersburg.

Philadelphia

New Red Cross Hospital.—The superintendent of the Medico-Chirurgical Hospital announces that the present staff of the hospital will be retained in its entirety as the staff of the First General Red Cross Hospital. The hospital building will be left intact until the end of the war.

Prevention of Tuberculosis.—Capt. Milton H. Fussell and Lieuts. David Riesman and Augustus A. Eshner, M. R. C., U. S. Army, have been appointed a board to investigate the conditions which may develop tuberculosis among officers of men among the National Army. They are making systematic surveys of the various mobilization and cantonment camps.

Personal.—The following physicians of Philadelphia have responded to the call of the Surgeon-General for men skilled in the treatment of the eye: Dr. George E. de Schweinitz, who has been commissioned a major in the Medical Reserve Corps; Drs. Benjamin F. Baer, Thomas B. Holloway, William T. Shoemaker, John G. Clark, Albert Pilkington, John R. Forst and L. Webster Fox.

Women's Medical College to Train for Service.—The Women's Medical College of Pennsylvania has arranged three special lecture courses to equip those who wish to serve their country. For the women who plan reconstructive work in the devastated villages of Europe, there will be thirty lectures weekly throughout the college year. This is a course on personal and public hygiene. Also there will be a course in laboratory technic to prepare for routine work in war hospitals, and a course in nutrition and dietetics.

Graduate Physicians Only Appointed.—At the meeting, August 7, of the South Philadelphia Branch of the Philadelphia County Medical Society, resolutions were adopted taking exception to the appointment of an osteopath as a member of the draft exemption board; recommending that only regularly graduated physicians be appointed on the draft board, and referring the matter for immediate approval to the county medical society, with the request that the governor of the state be notified of the attitude of the profession in this regard.

Hospital Units Ready.—Four of the six hospital units being formed in this city for active service have their personnel and equipment all complete, and are ready to sail at any time. These are the Jefferson, known as Base Hospital Unit No. 38, comprising twenty-two doctors, two dentists, sixty-five nurses, 152 enlisted men and five civilian employees; Red Cross Hospital Unit A of the Presbyterian Hospital, comprising twelve staff physicians, twenty nurses and fifty aids; the Episcopal Hospital, Base Unit No. 34, comprising twenty-five staff members, five stenographers, sixty-five nurses and 148 enlisted men, and that of the University of Pennsylvania. Besides these, the Hahnemann Hospital Unit and the Naval Hospital Unit of the Methodist Episcopal Church will be complete in the next few days.

CANADA

Legislation for Roentgenography.—The Medical Council of Ontario has initiated a movement to secure legislation to prevent unqualified men from doing roentgenographic work.

Free Distribution of Antitoxin.—Dr. Maurice M. Seymour, Regina, commissioner of public health for the Province of Saskatchewan, announces that on and after September 1, free distribution of diphtheria antitoxin will be made in that province by the provincial bureau of public health.

Sick and Wounded in Canadian Hospitals.—August 17, there were 8,811 soldiers receiving treatment in Canada; 7,032 in convalescent homes, 1,104 in sanatoriums for the treatment of tuberculosis, and 675 in other institutions. The returned soldiers are classified as those fit for general service; those fit for service abroad but not for general service; those fit for service in Canada; those temporarily unfit for service, and those awaiting discharge or reclassification.

The Bruce Report.—In spite of repeated requests in the Canadian House of Commons, the report of Col. Herbert A. Bruce, Toronto, in reply to the Baptie report, has not yet

been presented in that body. It is understood that many of the recommendations made by Dr. Bruce have since been adopted by the Canadian military authorities; and the delay in presenting the report is due to the fact that it had been forwarded to the Acting High Commissioner in London, and has not yet been returned.

Personal.—Capt. Roland Young, M.D., Oshawa, Ont., has returned after two years' service overseas. Dr. Young was in a hospital in Malta with the Royal Army Medical Corps, and lately had been in charge of an internment camp of Turks near Cairo, Egypt.——The Military Cross has been awarded the following members of the Canadian Army Medical Corps, recently: Capts. Hugh Hart, Douglas B. Kennedy, Ronald H. MacDonald, Saskatoon, Robert J. Manson and Arthur C. Armstrong.——The *Croix de Guerre* has been awarded by the French government to Lieut. W. E. Ord, R. A. M. C.

Venereal Disease Problem.—The Toronto Board of Health is going to grapple with this problem so far as it concerns the city of Toronto. It is not likely that notification will be required, as legislation would need to be sought for such power from the provincial legislature, but it may be expected that there will be some arrangement brought about between the medical officer of health and the practitioners of the city. A sign of good omen is the interest manifested in repeated editorials on the subject from time to time appearing in the public press. A few months ago the whole subject was gone into thoroughly by the public health section of the Academy of Medicine, and a resolution adopted calling on the provincial board of health to carry on an educational campaign, and for the government to lend financial assistance to the extent of $10,000 for the equipment and maintenance of district laboratories in various parts of the province.

New Officers.—The New Brunswick Medical Society annual meeting was held the latter part of July in St. John: Dr. Frederick H. Wetmore, Hampton, president; Dr. George G. Melvin, St. John, second vice president, and Dr. Stephen H. McDonald, St. John, corresponding secretary.——The Medical Society of Nova Scotia annual meeting was held in July at Halifax: president, Dr. Jordan W. Smith, Liverpool; secretary-treasurer, Dr. James R. Corston, Halifax, reelected. The next annual meeting will be held in Liverpool.—— The Canadian Medical Association annual meeting was held in Montreal: president, Dr. James McKenty, Winnipeg, Man. Winnipeg was decided on as the place of meeting in 1918. ——The Prince Edward Island Medical Society annual meeting was held in Summerside in July: president, Dr. Edwin T. Tanton, Summerside, and secretary, Dr. Ira J. Yeo, Charlottetown, reelected.

GENERAL

Exposition of the Chemical Industries.—The third National Exposition of Chemical Industries will be held in Grand Central Palace, New York, during the week of September 24. The exposition will cover all the ramifications of chemical industry.

Bequests and Donations.—The following bequests and donations have recently been announced:

St. Mary's Free Hospital for Children, New York, $2,000, by the will of Mrs. Laura F. Hearn.

Flagler Hospital, St. Augustine, Fla., $125,000, by the will of Mrs. Robert Worth Bingham, to rebuild the hospital, which was destroyed by fire last year.

Orthopedic Hospital, Philadelphia, $30,000, by the will of Lillie G. Newton.

Malaria and Hookworm.—Surg. French Simpson, U. S. P. H. S., has been ordered to Columbia, S. C., to take charge of the campaign against malaria.——Dr. Charles Wardell Stiles, U. S. P. H. S., has discovered forty-seven cases of hookworm in seventy-five recruits mobilized for war service, and these findings have caused the United States Public Health Service to recommend the prompt examination for hookworm of all units of the National Guard and National Army, especially those from the South.

Missouri Valley Physicians to Meet.—The thirtieth annual meeting of the Medical Society of the Missouri Valley will be held in Lincoln, Neb., September 20 and 21, with headquarters at the Hotel Lincoln. Dr. Charles R. Woodson, St. Joseph, Mo., is president of the association, and Dr. Charles Wood Fassett, Kansas City, Mo., secretary. The arrangements are in the hands of the Lancaster County Medical Society, with Dr. Karl S. Hohlen as chairman. The principal topic for the meeting is announced as "How Can a Medical Man Best Serve His Country?"

Mississippi Valley Association Meeting.—The forty-third annual meeting of the Mississippi Valley Medical Association will be held in Toledo, October 9-11, under the presidency of Dr. Channing W. Barrett, Chicago. The Hotel Secor has been selected as headquarters, and Dr. Willard J. Stone, Toledo, is chairman of the committee of arrangements. The oration in surgery will be delivered by Dr. Joseph C. Bloodgood, Baltimore, and on the last day a joint session will be held with the Inter-State Association of Anesthetists. The principal symposiums will be on Surgery of the War; Otology and Ophthalmology; Goiter and Syphilis.

Federal Child Labor Law Becomes Effective.—The Federal Child Labor Law becomes effective, September 1, after which date no child under 14 may be employed in any factory, mill, workshop or cannery in the United States, the products of which are to be shipped in interstate commerce, and no child under 16 years of age may be employed in a mine or quarry. The working day of children between 14 and 16 years of age must not be longer than eight hours, and they may not be employed between 7 p. m. and 6 a. m. The Children's Bureau of the Department of Labor is actively undertaking the coordination of this new federal law with those of the various states.

Civil Service Examinations.—The following examinations are announced by the United States Civil Service Commission:

September 18: Inspector, Child Labor Division; salary, $1,800 to $2,400; duties, to keep informed as to the employment of children in all industries, to make inspections of factories, mills, mines, workshops, etc.; to supervise the work of assistant inspectors, and to aid in the enforcement of the law.

September 18: Assistant Director, Child Labor Division; salary, $2,400 to $2,820; applicants should be familiar with the general problems of child protection and factory inspection, and should have administrative ability.

September 18: Experts in Child Welfare; salary, $1,800 to $2,400; duties, the planning, supervising and writing of reports on special studies of the various aspects of child welfare, such as infant mortality, the birth rate, orphanages, desertion, juvenile court, dangerous occupations, accidents and diseases of children, employment, and legislation affecting children.

September 18: Assistants in the Prevention of Infant Mortality (women); salary, $1,800 to $2,400; applicants must be graduates from a school of nursing; duties, to assist in conducting investigations into the causes of infant, child, and maternal mortality, and into community measures for their prevention, and to make reports on these subjects, with recommendations for improvement.

September 18: Experts in the Prevention of Infant Mortality; salary, $2,400 to $3,600; applicants must be graduates of a medical school of recognized standing, and must have at least three years' specialization in hygiene and diseases of childhood or in the prevention of infant and child mortality; the duties are to plan and conduct investigations into the causes of infant, child, and maternal mortality; into the methods of their prevention, and into dangerous and injurious occupations and other matters relating to the health of children.

September 19-20: Special Agents and Research Assistants; salary, $1,200 to $1,680; duties, the collection in the field of data for use in the preparation of reports.

Applications should be made to the Civil Service Commission, Washington, D. C., or a local civil service board, stating the title of the examination desired, and these applications should be filed with the commission at Washington, prior to the hour of closing business on the date stated above.

FOREIGN

Deaths in the Profession Abroad.—The cable brings word of the death of two prominent chemists in Germany last week, **Adolf von Baeyer,** a giant of chemical synthesis, professor of chemistry at the University of Munich, raised to the hereditary nobility with the title of "Excellency" some years ago. Also **Eduard Buchner,** professor of chemistry at the University of Würzburg, and chief of the Chemical Institute. He has been serving at the front with the rank of major, and succumbed to wounds.——**H. Taborda,** an eminent medicolegal authority in Argentina, director of the *Revista del Circulo Medico Argentino* and founder of the international organization of university students of Latin America.——**H. Gallay,** inspector of the French colonial troops.——**H. F. H. Newington,** president of the Medico-Psychological Association of Great Britain and Ireland, aged 70.——**T. B. Darling** of Edinburgh. Recent casualty lists contain the names of Capt. **G. S. Pirie** of Cape Town; Major **W. D. Kirkland** of Australia; Lieut.-Col. **J. H. Horton,** aged 46, who had served in Africa, in India and with the British Red Cross in the Balkan War of 1912. He had charge of an Indian field ambulance in France since the beginning of the war; Capt. **R. H. Bharucha** of India; Capt. **R. H. Drennan** of Ireland; Capt. **G. D. East** and Capt. **A. C. Edwards** of England.

PARIS LETTER

PARIS, Aug. 2, 1917.

The War

IMMEDIATE SURGICAL TREATMENT OF PULMONARY WOUNDS

At one of the recent meetings of the Société de chirurgie de Paris, Dr. Barnsby reported four new cases of primary thoracotomy in the treatment of pulmonary wounds caused by the bursting of shells, all of which cases resulted in recovery. Dr. Lefévre operated in two of the cases and Dr. Barnsby in the other two. In all four cases the operations were performed under ether anesthesia on a closed thorax and were undertaken with a view to the direct treatment of the pulmonary wound by the extraction of the projectiles and the costal splinters, the suturing of the lung and the cleansing of the pleura. In three of the cases there was a large enclosed fragment, covered by a strip of flesh. In one case the projectile had penetrated the right side of the chest after the manner of a seton and had pierced the right lung, producing a hemorrhage, on which account the lung was resected and sutured. The projectile also ripped up the diaphragm for a length of 12 cm. and introduced costal splinters and particles of clothing into the lung and the pleural cavity. In all these cases one side of the chest was evacuated and in two cases the suturing of the lung was accomplished (in one case after resection). In two of these cases particles of clothing and free splinters embedded in the lungs or in the pleura were removed. In all cases a cleansing of the pleura under ether and a primary suture without drainage were effected.

Barnsby emphasizes the following points: 1. The simplicity of ether anesthesia, for which the tolerance of patients with chest wounds is excellent. 2. The extraordinary ease with which the severely wounded endure thoracotomy, and the possibility of working more deliberately in thoracotomy as compared with laparotomy, as is shown by the curves of maximal and minimal tension. In the first case (a difficult thorax case), the maximal tension decreased at the end of the ether anesthesia, rose again shortly, and became stable in spite of the pneumothorax, the traction on the lung and the cleansing of the pleura under ether. In the second case (a simple abdominal case), all the steps taken in the course of the operation—the incision of the peritoneum, traction on the stomach or the intestine, and lavage of the peritoneum under ether—produce an abrupt effect on the maximal and minimal tension. 3. The advantage of anterolateral thoracotomy (according to Duval) with ample permanent or temporary resection of the fourth rib which permits one to see everything and to suture a lung quickly and well. 4. The frequency of free costal splinters embedded in the lungs or the pleura. 5. The desirability of primary suturing if one operates within six hours and everything is in good shape and the pulmonary wound is correctly repaired. 6. That an advantage might lie in favor of draining the pleura if one operates after twelve hours or more, and if it is impossible to make a taut suture of the lung and more especially of the wall, which occurs frequently in the case of broken ribs, accompanied by extensive destruction of the pleura and the parietal muscles. The purpose of pleural drainage would be to avoid complications, benign, it is true, as compared with the operation itself, but nevertheless troublesome, such as repeated punctures of the pleural collections which may be still frequent, and the drainage made necessary by secondary purulent pleurisy.

To sum up, primary thoracotomy for the immediate treatment of pulmonary wounds is an excellent operation, which, in certain cases, makes it possible to save the lives of men otherwise doomed to certain death. Besides an open thorax, as regards which there is common agreement, it constitutes the operation of choice if it is a question of applying it also to serious wounds within a closed thorax. By this is meant men with chest wounds, especially those who have been hit by large shell splinters, who reach the first-aid stations suffering from shock, with a pale facies, a strong dyspnea, a bad pulse, those whose tension is low and sinks lower during the hour following their arrival—those who, in a word, most frequently die if one refrains from operating. Intervention, to be sure, will not save them all, but it will enable us to lower the percentage of mortality.

SPECIAL DISPENSATION TO STUDENTS KEPT BACK BY THE WAR

The minister of public instruction recently signed a decree abolishing, for the duration of the war, certain regulations in regard to grades and credits, which will inure to the benefit of students who have been kept back in their studies owing to the exigency of war. This decree applies exclusively to the entrance requirements for admission to the colleges and institutions of higher learning, and to special exemptions granted with reference to prerequisite scholarship in connection with studies pursued in these institutions.

AMERICAN SANITARY AID IN THE FIGHT AGAINST TUBERCULOSIS

A few days ago, there arrived in Bordeaux an American sanitary mission, chairman of which is Dr. Livingstone Ferrand, president of the University of Colorado. Associated with Dr. Ferrand are Dr. Miller of the University of Columbia; Dr. Fox, sociologist and chairman of the State Charities Aid Association of New York, and Mr. Place, secretary of the mission.

Toward the middle of 1915, the report was spread in the United States that tuberculosis was making frightful ravages in France, not only in the army, but among the civil population as well. Accordingly, the American government sent to France last winter a commission of inquiry, whose duty it should be to inquire into the matter. The truth of the report was soon verified. Under these circumstances, the government of the United States, with the cooperation of the Rockefeller Foundation, decided to aid the French authorities in their fight against the devastating scourge by placing at their disposal men who had had experience with the antituberculosis methods employed with such great success in America, as shown by the following statement made by Dr. Livingstone Ferrand: "During the last twenty-five years the mortality due to tuberculosis has diminished in America by 50 per cent., owing to the therapeutic and preventive measures that have been adopted."

The mission will visit without delay those of our hospitals in which tuberculous patients are cared for, and will aid in the introduction and application of the methods which have been developed in the United States.

LONDON LETTER

LONDON, Aug. 7, 1917.

The Annual Meeting of the British Medical Association

The eighty-fifth annual meeting of the British Medical Association has been held in London. In consequence of the war, no scientific papers were read and only political subjects were discussed. The resolution of the Central Medical War Committee approving of the principle of mobilization of the medical profession apart from any question of general mobilization of the whole community, so that every individual whose name is on the National Register shall be held bound to give such service as he is competent to give when required to do so by the government, was passed with the proviso, "provided such mobilization be carried out on a scheme approved by the profession under the discretion of an accredited representative." This proviso was adopted after rejection of an amendment by the Liverpool branch disapproving of any attempt to control the liberties of the profession differently from those of members of other professions.

A Ministry of Health

At the request of the government, the council of the British Medical Association submitted the following scheme for the creation of the Ministry of Health: "That a ministry of health should be created to take over from existing government departments such duties as are concerned with the health of the community, and to deal with those duties only; that the administrative functions of the ministry should be carried out by a board presided over by a minister of cabinet rank; that the country be divided into suitable administrative areas under local administrative health centers consisting of representatives (*a*) of the rating authorities; (*b*) of the education authorities; (*c*) of the persons contributing to a scheme of health insurance (including employers of labor); (*d*) the medical profession; (*e*) public hospitals; (*f*) dentists; (*g*) pharmacists, and (*h*) nurses; that the principal medical officers of each center should be two, of equal status, one representing the clinical side (chief clinical officer) and the other the preventive side of medicine (medical officer of health); that for each area, hospitals, clinics or treatment centers should be recognized or established at which persons entitled to treatment under the public scheme should be able to obtain institutional, consultative or specialist services on the recommendation of their medical attendant." The meeting passed a resolution by an overwhelming majority in favor of the appointment of a ministry of health. The president, Sir Clifford Allbutt, was reelected president for the coming year, and the hope was expressed that next year the meeting might be held at Cambridge, where the association

might have the pleasure of hearing one of his polished and scholarly addresses as well as an address or two in medicine and surgery, though meetings of the sections were out of the question.

The Health of London: Marked Freedom from Diseases

The report of the medical officer of health of the London County Council (Dr. W. H. Hamer) for the year 1916, which has just been issued, shows that the health of London during the year compares favorably with that of 1915. The general condition as regards nutrition of the mass of the people has probably rarely, if ever, been better, and there has been freedom beyond the most sanguine anticipations from most of the war diseases. Much of this has been due to the war restrictions on communication and traffic, especially with countries abroad. The termination of the war will favor the spread of infectious diseases, and the need of the maintenance of the sanitary service, which is at present much depleted, is becoming increasingly apparent as the months pass by. The deaths of infants under 1 year of age in London during 1916 numbered 8,864, or 89 per thousand births (as compared with the rate of 112 in 1915), the lowest infant mortality rate ever recorded in the county. The reduction in the number of deaths from suffocation, and perhaps in less degree from prematurity, may be a result of the restriction of the sale of intoxicants. There was evidence of introduction of pediculosis and scabies by returned soldiers, but typhus did not obtain any footing. Smallpox was imported from time to time, but there was no serious prevalence. There were 461 cases of typhoid fever reported, as compared with 607 in 1915, but the figures are not strictly comparable, as the practice relating to inclusion of military cases was not the same as in the two preceding years. The great decline of recent years in prevalence of typhoid fever has proceeded practically *pari passu* with the abandonment of the consumption of shellfish and fish from polluted sources, and, with removal of laying, etc., to a distance from sewer outfalls. There were 915 civilian deaths from influenza, as compared with 1,058 in 1915; 5,593 deaths from bronchitis, as compared with 7,058 in 1915, and 5,222 deaths from pneumonia, as against 7,133 in 1915. Nine cases of human anthrax occurred, all of which were traceable to the handling of hides or fiber for brushes. It appears desirable that more stringent regulations governing the importation of hair should be made.

The Increase in the Price of Drugs

The steady rise in the prices of drugs continues almost without interruption, and extraordinary figures have now been reached. Phenacetin now costs more than thirty times the price of three years ago, cocain six times, caffein four times, aspirin six times, phenol (carbolic acid) four times, and cod liver oil six times. According to the *Lancet*, the greatly increased cost of drugs in South Africa, consequent on the war, is becoming a matter of moment to the hospitals and the military authorities. A large quantity of quinin has been used to combat malarial fever in the campaign in German East Africa, and the price of quinin has advanced enormously. Great difficulty is experienced in South Africa in obtaining requisite supplies of such an essential as phenol. The cost of drugs at Pretoria Hospital, where there is a large amount of military work, has advanced from $10,000 to $25,000 a year; at the Johannesburg General Hospital the increase has been $15,000.

The War and the Pharmacopeia

In consequence of the shortage of sugar and of glycerin (because of its use in the manufacture of explosives), the General Medical Council has withdrawn from the pharmacopeia the following: all confections except confection of pepper, confection of rose, and glycerin preparations; all mixtures except chalk mixture, compound iron mixture, and castor oil mixture; all syrups except simple syrup, chloral syrup, syrup of codein phosphate, syrup of iron iodid, syrup of iron phosphate with quinin and strychnin, and syrup of glucose; all lozenges except lozenges of krameria and cocain, lozenges of morphin, and lozenges of morphin and ipecacuanha; also effervescent caffein citrate, compound decoction of aloes, liquid extract of cotton-root bark; liniment of potassium iodid with soap; saccharated solution of lime, effervescing Epsom salt, borax and honey, compound powder of almonds, compound liquorice powder, compound tragacanth powder, effervescing sodium citrotartrate, glycerin suppositories, compound tincture of cardamom, tincture of kino, tincture of wild cherry, compound tincture of rhubarb, compound tincture of senna, and iodin ointment. It is thus open to pharmacists to modify these preparations.

Marriages

LIEUT. MATHEW CHARLES HUNTER, M. C., Ohio N. G., Lewisburg, Ohio, to Miss Catherine Foody of Columbus, Ohio, at London, Ohio, August 6.

LIEUT. NORMAN ALBERTUS TIMMONS, M. R. C., U. S. Army, South Bethlehem, Pa., to Miss Rozella Dively of Bedford, Pa., at Bethlehem, August 13.

LIEUT. JAMES FRANCIS KELLY, M. R. C., U. S. Army, Dawson, Neb., to Miss Henriette Frances Wadsworth of Omaha, July 2.

CAPT. WILLIAM JOSEPH COLEMAN, Md. N. G., Baltimore, to Miss Laura S. Chapline, also of Baltimore, recently.

JOHN HUNTER PEAK, M.D., to Miss Emily H. Myers, both of Louisville, Ky., at Cincinnati, August 8.

HAROLD ALBERT ELKINS, M.D., Hardin, Mo., to Miss Esther Jane Orr of Mt. Carmel, Ill., August 15.

MANFORD O. OPPEGAARD, M.D., Minneapolis, to Miss Hazel Miner of Flandereau, S. D., August 11.

EVERETT SPERRY BARR, M.D., Amelia, Va., to Miss Alpha Rasor of Biltmore, N. C., August 6.

WILLIAM C. SCHIELE, M.D., Galena, Ill., to Miss Anna Reifsteck of Hanover, August 15.

JACOB RICHARD PIERCE, M.D., to Miss Vesta Mae Kirby, both of Debo, Wyo., June 25.

ISADORE EMIL KOHN, M.D., to Miss Dolfy Newman, both of Chicago, recently.

Deaths

Frank Leon Waldorf, M.D., East Syracuse, N. Y.; University of Syracuse, N. Y., 1910; aged 30; a Fellow of the American Medical Association, and a specialist in clinical pathology; health officer of Eastwood; pathologist, bacteriologist and director of laboratories at the Hospital of the Good Shepherd, Syracuse; pathologist to the Syracuse Hospital for Women and Children; instructor in laboratory diagnosis in his alma mater; died at the Hospital of the Good Shepherd, Syracuse, August 14, from septicemia, due to a necropsy wound of the finger received July 18.

Abner Esgar Foltz, M.D., Ashland, Ohio; University of Wooster, Cleveland, 1868; aged 77; a life member of the Ohio State Medical Association, and president of the Summit County Medical Society in 1892; a veteran of the Civil War; designer of the clinical chart at present commonly in use, and of the optician's chart; died at his home, August 15, from cerebral hemorrhage.

Henry Freeman Walker, M.D., New York; College of Physicians and Surgeons in the City of New York, 1866; aged 79; a Fellow of the American Medical Association, and a member of the New York Academy of Medicine; Consulting physician to St. Luke's Hospital; died at his summer home in Pittsford, Vt., August 12, from heart disease.

Raleigh Claude Farquhar, M.D., California, Pa.; Jefferson Medical College, 1903; aged 38; formerly a Fellow of the American Medical Association; a member of the Medical Society of the State of Pennsylvania; a member of the staff of the Memorial Hospital, Monongahela; died in St. Francis Hospital, Pittsburgh, August 11, from nephritis.

Hosea Ellsworth Walker, M.D., Rosebank, N. Y.; Bellevue Hospital Medical College, 1892; aged 52; a member of the Medical Society of the State of New York, and for many years a practitioner of Staten Island; visiting physician to St. Vincent's Hospital, Manhattan; died at his home in Fort Wadsworth, Staten Island, August 16.

William L. Jerkins, M.D., Moultrie, Ga.; Atlanta (Ga.) Medical College, 1893; aged 46; formerly a Fellow of the American Medical Association; a member of the Medical Association of Georgia, and once president of the Colquitt County Medical Society; a specialist in diseases of the eye and ear; died at his home, August 8.

A. M. Curtis, M.D., Waco, Texas; Atlanta (Ga.) Medical College, 1875; aged 65; a member of the State Medical Association of Texas; vice president of the National City Bank, Waco, Texas Life Insurance Company, and Texas Saving-Loan Company; owner of the Curtis' Sanitarium, Waco; died in that institution, August 10.

James Clark Earle, M.D., Olean, N. Y.; University of Buffalo, N. Y., 1887; aged 51; at one time chief surgeon of the Northern Division of the Pennsylvania System, and a member of the city council; died at his home, August 7.

Thomas Edward Callahan, M.D., Saguache, Colo.; Maryland Medical College, Baltimore, 1904; aged 43; a member of the Colorado State Medical Society; was shot and instantly killed in a fight in a saloon at Ortiz, N. M., August 11.

Jesse Barr Webb, M.D., Lodi, Va.; University of the South, Sewanee, Tenn., 1907; aged 39; formerly a member of the Medical Society of Virginia; died suddenly, about August 7, while making a professional call in Abingdon, Va.

Arthur J. Daykin, M.D., Wadsworth, Ohio; Western Reserve University, Cleveland, 1889; aged 50; a lecturer in his alma mater, and for many years a practitioner of Cleveland; died at his home, August 3, from pneumonia.

Edward Anderson, M.D., Rockville, Md.; University of Maryland, Baltimore, 1875; aged 76; a Fellow of the American Medical Association, and physician to the Montgomery County Alms House; died at his home, August 15.

Henry K. Neill, M.D., Richfield, Utah; University of Glasgow, Scotland, 1880; aged 61; formerly a member of the Utah State Medical Association, also a druggist; died at his home, August 6, from malignant disease.

Isidore Hermanigilde Chicoine, M.D., Lynn, Mass.; Harvard Medical School, 1894; aged 52; a member of the Massachusetts Medical Society; a member of the staff of the Lynn Hospital; died recently at his home.

Thomas A. Chappell, M.D., Jacksonville, Fla.; Savannah (Ga.) Medical College, 1869; aged 72; a Confederate veteran; died at St. Luke's Hospital, Jacksonville, July 27, from cerebral hemorrhage.

Kate S. Trainor Kavanaugh, M.D., Minneapolis; Hahnemann Medical College, Chicago, 1891; aged 63; a member of the Minnesota State Medical Association; died at her home, August 16.

Wilson Saffin, M.D., Cincinnati; Medical College of Ohio, Cincinnati, 1880; aged 58; formerly a Fellow of the American Medical Association; died at his home, August 19.

Isaac A. Roseberry, Independence, Ind. (license, Indiana, 1897); aged 84; village physician of Independence since 1855; died at his home, August 2, from cerebral hemorrhage.

William M. Beaver, Colby, Kan. (license, Kansas, 1901); aged 72; formerly a member of the Kansas Medical Society; a practitioner since 1869; died at his home, August 8.

Walter Scott Mason, M.D., Cedar Point, Kan.; Rush Medical College, 1880; aged 67; died on his ranch, south of Cedar Point, Kan., August 7, from cerebral hemorrhage.

Scott T. Lameroux, Indianapolis (license, Indiana, 1901); aged 70; died in the hospital of the Indiana State Soldiers' Home, Lafayette, June 7, from facial erysipelas.

John Thomas Hiatt, M.D., Asheville, N. C.; Atlantic College of Physicians and Surgeons, Atlanta, Ga., 1901; aged 50; died at his home, May 29, from nephritis.

John West Oldshue, M.D., Pittsburgh; Philadelphia University of Medicine and Surgery, 1881; aged 69; died in St. Francis' Hospital, Pittsburgh, August 9.

William Thomas Batterson, M.D., Springfield, Ohio; University of Michigan, Ann Arbor, 1880; aged 60; died in the City Hospital, Springfield, August 10.

Charles David De Frantz, M.D., Denver; Meharry Medical College, Nashville, Tenn., 1905; aged 41; a colored practitioner; died at his home, July 26.

David Henry Stern, M.D., Chicago; Eclectic Medical College of the State of New York, 1892; aged 71; died at his home in Chicago, August 24.

Caleb Barker, Jr., M.D., New Rochelle, N. Y.; New York Homeopathic Medical College, New York, 1901; aged 39; died at his home, August 1.

Elbert Clarence Drake, M.D., Brooklyn; New York University, New York, 1876; aged 70; died at his home, August 2, from nephritis.

Thomas L. Anderson, McAlester, Okla. (license, Oklahoma, 1908); aged 39; a colored practitioner; died at his home, August 3.

Warren A. Maxfield, M.D., Hudsonville, Mich.; Rush Medical College, 1896; died at his home, July 31.

Richard Sobey, Chicago (license, Illinois, 1895); died at his home, July 31.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

CHAMLEY IS STILL LOOSE

S. R. Chamley—sometimes he spells his name "Chamlee"—is a resident of Los Angeles. Chamley is the "cancer cure" quack who frightens impressionable women into the belief that "any lump in woman's breast is cancer." He has been swindling the sick for years. In December, 1909, while living at St. Louis, but also operating from Los Angeles, a fraud-order was issued against him under his various names applying both to his St. Louis and to his Los Angeles offices. Then Chamley changed the name of his concern to "St. Louis Sanitarium," using a postoffice box; in January, 1910, the fraud-order was extended to cover this new name. Chamley transferred his swindle to Oakland, Calif., and some weeks later the fraud-order was still further extended to cover the Oakland address. He opened offices in St. Louis and Los Angeles under still another name—the "United Specialists Cancer Cure Company"—and the federal authorities in February, 1910, denied these the use of the mails.

In March, 1910, the fraud-orders were revoked in so far as they affected Chamley's personal names, the quack having agreed to go out of the "cancer cure" business and having filed an affidavit to this effect with the federal authorities. His oath, as might have been expected, was as worthless as his business is villainous. THE JOURNAL in August, 1915, called attention to the fact that Chamley was sending out letters to physicians offering to sell for $20 full instructions that would enable physicians to carry out the same cruel swindles that he himself had waxed rich on. Also he was boldly advertising his fraudulent cancer cure in over a hundred newspapers. About the same time Chamley was indicted by a grand jury at San Francisco for obtaining property under false pretenses. From the newspaper reports it seems that he frightened a woman into believing she had cancer and then obtained a promissory note for $2,000 for an "operation" which he persuaded the woman he would have to perform. After the victim had paid $1,500 on the note, the quack, it appears, told her she must be operated on again and he demanded more money. Two women who acted as nurses for Chamley are said to have testified before the grand jury that Chamley admitted that he knew the woman had no cancer but that he meant to get all the money he could.

The federal officials again took action and still another fraud-order was issued against Chamley. At that time Judge W. H. Lamar, solicitor for the Post Office Department, in his memorandum to the Postmaster-General, scathingly summarized the case against Chamley thus:

> "It may be said that the business of Dr. Chamley, contemplating as it does the extortion of money for a worthless and often harmful 'treatment' through a deliberate propaganda of terror among impressionable women by means of the cancer advertisements and other literature referred to above, is one of the most vicious which has ever been before this office, and constitutes a more sinister parasite on the community than the dread disease which Dr. Chamley offers to 'cure.'"

This was in April, 1916. In April, 1917, Chamley was fined $100 and given a suspended sentence of 100 days in the city jail for practicing medicine without a license. We are now in possession of a circular letter, signed S. R. Chamley and addressed to homeopaths and eclectics. We quote the first four paragraphs of the letter:

> "I find your name in the Directory as a Homeopath or Eclectic and want to inform you that I have opened a little HOMEOPATHIC AND ECLECTIC CANCER COLLEGE (never for alapaths) [*sic!*]. I want to beg you to attend or at least visit us so that I may show you the need of more cancer specialists.
>
> "I charge only $20.00 for a course of instructions, demonstrations and clinics, including the book containing all the formulas for killing

and curing cancers with what we claim is the best ESCHAROTIC ever discovered. It is the nearest painless and most efficient.

"If you will advertise in a way that will teach and warn the people to not neglect lumps and sores, I will come to your office, start your advertising and pay for it myself out of my own money to the amount of $50.00 and stay in your office and teach you, if you give me all that comes in from cancer patients.

"At the end of two, three or four weeks, I quit and leave you to pay your own advertising and make all you can. I would visit you again when I could. I am traveling this way nearly all the time in Southern California but will give a course of lectures here in the college all of October as I want to be in the Billy Sunday meetings nights. You need to stay only two or three days."

The rest of the letter is largely devoted to flings at the Post Office Department and at other officials that have been responsible for curbing Chamley's damnable activities. One paragraph, however, stands out in bold capitals:

"I WANT THREE OR FOUR HOMEOPATHIC OR ECLECTIC PHYSICIANS TO START OTHER OFFICES FOR ME BUT THEY MUST BE GRAY, FINE APPEARING BUSINESS MEN."

It will be noticed that Chamley insists on three essentials for those who would start offices to perpetuate his wretched business: First, that the men must be either "homeopathic or eclectic physicians"; a proper rebuke for this implied insult may safely be left to the decent representatives of these two schools. Second, that the men "must be gray"; this of course, is to enable them to put up the proper "front" and to convey the idea that they have grown venerable in the practice of their "specialty." The third is that they must be "business men," which means, in the vocabulary of the quack, that they will have no foolish professional prejudices against frightening women who have some simple, benign tumor into the belief that they have carcinoma and, having thus frightened them, will not be above robbing them of all the money they are able to get their hands on. For the purpose of still further defeating the ends of justice Chamley warns those to whom he writes that they should not address mail to him but to "Homeopathic Cancer College, 751 S. Main St., Los Angeles."

Chamley is a versatile and long-lived scoundrel. We have in our files copies of much of the evidence taken when Chamley was under investigation in St. Louis in 1909. The damning facts there brought out make a well-nigh unbelievable story of cupidity, ignorance and cruelty. Yet in all the years that Chamley has been able to pursue his villainous trade he seems, by some means or another, to have kept out of the penitentiary. Why, we do not know. Common justice and a decent regard for the public safety alike would seem to demand that he be sent there.

SOME MISCELLANEOUS NOSTRUMS

Bon-Opto.—This "eye medicine," put on the market by the Valmas Drug Company, Detroit, is sold under the claim that it will "Make Weak Eyes Strong" and that it "Strengthens Eyesight 50 Per Cent. in One Week's Time in Many Instances." The testimonial type of advertising is, of course, employed. A man, "almost blind," used Bon-Opto and now "can read everything"; a woman to whom "the trees across the street" were for several years but "a dim green blur," was able to "count the fluttering leaves" after using Bon-Opto! Physicians—"prominent," of course—whose initials are unfortunately omitted, are quoted as testifying enthusiastically regarding the virtues of Bon-Opto. Two of these noted individuals are quoted at length in a French-Canadian paper. One of them is "Le Dr Beck, un spécialiste pour la vue, de New-York" while another is "Le Dr. Judkins, médecin de Massachusetts, autrefois chef de chimique au Union General Hospital, Boston, Mass., anciennement chirurgien interne à la New-England Eye and Ear Infirmary de Portland, Maine, et auteur médical." Then in the papers in the United States there are testimonials from Drs. Smith, Connor and Lewis whose initials, curiously enough, the Valmas Drug Co. also fails to give. In soliciting druggists to carry their nostrum, the Bon-Opto concern perpetrates a joke that is as impudent as it is humorous. In a letter addressed to the druggist they give what purports to be the ingredients of the nostrum but carefully abstain from giving any quantities so that the alleged formula is meaningless. The opening paragraph of one of these letters reads:

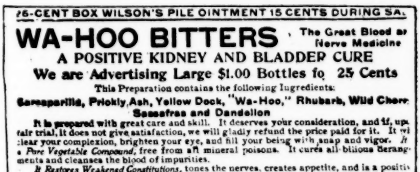
"Conscientious, careful druggists who refuse to recommend any remedy unless they know what is in it will appreciate the following formula of Bon-Opto for the eyes and the fact that we make no secret of it but print it on every package:

Chloretone	Boric Acid
Zinc Sulphate	Menthe Poivree
Sodium Chloride	Camphre de Menthe"

Just what *"Menthe Poivree"* and *"Camphre de Menthe"* are is not disclosed but they may be counted on to add to the mystery which must envelope the average "patent medicine" if it is to become a commercial success. Yet the Bon-Opto concern has the effrontery to say in its letter: "As a qualified druggist you will immediately recognize its great therapeutic value"! In the newspaper advertisements the public is assured: "Bon-Opto is not a patent medicine or secret remedy." The facts are Bon-Opto *is* a secret remedy and is just as much a "patent medicine" as "Peruna" or "Paine's Celery Compound." In fact, the latter nostrums, thanks to the requirements of the federal law, give the quantitative formula of at least one of their ingredients, which is more than can be said for Bon-Opto. The state chemists of New Hampshire in their bulletin for 1917 state that Bon-Opto contains:

Sodium Chlorid (common salt)	39.52
Zinc Sulphate (white vitriol)	6.83
Boric Acid	39.69
Menthol	a small amount

Wilson's Wa-Hoo Bitters.—Charles Kent Wilson of Toledo, Ohio, who did business under the trade name Old Indian Medicine Company, Battle Creek, Mich., and Toledo, Ohio,


25-CENT BOX WILSON'S PILE OINTMENT 15 CENTS DURING SA
WA-HOO BITTERS
The Great Blood an Nerve Medicine
A POSITIVE KIDNEY AND BLADDER CURE
We are Advertising Large $1.00 Bottles fo 25 Cents
This Preparation contains the following Ingredients:
Sarsaparilla, Prickly Ash, Yellow Dock, "Wa-Hoo," Rhubarb, Wild Cher
Sassafras and Dandelion
It is prepared with great care and skill. It deserves your consideration, and if, upfair trial, it does not give satisfaction, we will gladly refund the price paid for it. It vi
clear your complexion, brighten your eye, and fill your being with snap and vigor. It
a Pure Vegetable Compound, free from all mineral poisons. It cures all bilious derang
ments and cleanses the blood of impurities.
It Restores Weakened Constitutions, tones the nerves, creates appetite, and is a positiv
cure for Rheumatism, Blood Disorders, Stomach Troubles, Liver and Kidney Complaint
Sick Headache, Malaria, Pimples, Boils, Dyspepsia, Constipation, Catarrh of the Stomac
Nervousness, Skin Diseases, Salt Rheum and Neuralgia. Female Weakness and Irreg
larities promptly relieved and permanently cured.
To Introduce and Advertise this Great Remedy, we will sell for a
Few Days at 25 Cents
MANUFACTURED BY
Old Indian Medicine Co., Battle Creek, Mich., Toledo, O

manufactured and sold "C. K. Wilson's Original Wa-Hoo Bitters." This was sold as a "Great Blood and Nerve Tonic" and as an unfailing specific for partial paralysis, St. Vitus' Dance and all forms of weakness, as well as an effective remedy for malaria, catarrh of the stomach, salt rheum, scrofula and neuralgia. The chemists of the Bureau reported that the product was a watery solution (slightly sweetened) of Epsom salt, salicylic acid and a laxative plant drug with indications of sassafras, gentian and prickly ash. The therapeutic claims were declared recklessly and wantonly false and fraudulent. Wilson pleaded guilty and was fined $25 and costs.—[*Notice of Judgment No. 4523.*]

Italian "Index Medicus."—The bacteriologic laboratory of the Italian Public Health Service has just published the first annual volume of the "Annuario bibliografico italiano delle scienze mediche ed affini." It contains in alphabetical sequence the titles of all the works on medical and allied subjects that appeared in Italian periodicals in 1916. It thus covers 100 journals, nearly all medical, with some of more general scope, but with articles that bear on medical topics. It forms a small volume of 382 pages. Professor Gosio is in charge of the undertaking, as well as of the bacteriologic laboratory.

Correspondence

"PATRIOTISM RAMPANT"

To the Editor:—Referring to your comment (THE JOURNAL, Aug. 18, 1917, p. 570) criticizing the Michigan State Board of Registration in Medicine for its action concerning German as an entrance requirement—an expression which has already received the approbation of the *Detroiter Abend Post*—permit me to refer to the dictum of the German philosopher, Eucken, who, with characteristic Prussian arrogance, has declared that the spread of German Kultur is necessary to the "spiritual preservation of mankind." Action on the part of other boards in the United States similar to that of the Michigan state board might furnish an interesting test case as to whether it is practically indispensable.

Personally, I am inclined to concur in the long ago quoted opinion of Osler to the effect that international science has been annihilated for this generation through the justification on the part of the doctors of letters of Germany of the abominations of the kaiser and his assistant assassins. Truth may lie between the extremes of Eucken and Osler, but this country has apparently already had quite enough of the activities of Münsterberg (who, though dead, yet speaketh), Dernburg, and the Borussen Gesellschaft.

In dealing with the dissension- and disloyalty-breeding German element in this country, sentimental considerations need not obtain. Expediency should govern. Concerning the debatable question of the expediency of a particular act I desire to speak out plainly my own conviction that the time has come to set a back-fire. Kindliness and tolerance should be reciprocal and this is impossible because the American-Kaiserite and the one hundred per cent. American have nothing in common.

C. B. BURR, M.D., Flint, Mich.

THE RUSSELL EMULSION AND THE RUSSELL PREPARED GREEN BONE

To the Editor:—In the issue of THE JOURNAL of the American Medical Association of June 23, 1917, under the heading, "The Propaganda for Reform," you publish certain data, said to be a "Report of the Council on Pharmacy and Chemistry," relating to products manufactured by us. We did not request you to report on these products or to admit them to "New and Nonofficial Remedies." Please state, therefore, your authority for so doing.

STANDARD EMULSION COMPANY, New York.

[COMMENT.—The "certain data" referred to above is a report of the Council on Pharmacy and Chemistry on the "Russell Emulsion" and the "Russell Prepared Green Bone." The report criticized the absurdity of the claims made for these products and declared that the products themselves were inadmissible to New and Nonofficial Remedies. THE JOURNAL nowhere stated, either directly or by inference, that the Standard Emulsion Company had requested that a report be made on its products or that they be admitted to New and Nonofficial Remedies. Those of our readers who may have overlooked this article can obtain a reprint of it by sending a 2-cent stamp and a request for the reprint.—ED.]

IMMEDIATE ACTION BY CONSCRIPTED MEDICAL STUDENTS

To the Editor:—The exemption of medical students until the completion of their course has become a question of national importance, and at the same time the probability of such exemption has become so slight as to be almost negligible. Something must be done by the student body itself, and that must be done quickly.

Without question the authorities have thus far shown themselves rather near-sighted in regard to this question. Just as a near-sighted person can best perceive an object properly when that object is brought close to his eyes, so would our authorities best see this question in its true light, if it were persistently and very closely brought to their attention. My suggestion is this:

Let not the conscripted students wait passively for action from Washington. Let each one immediately file claim for discharge at his district board on industrial grounds (Forms 161 and 161a, modified for the purpose of medical students). These claims will probably be denied. Then let each one immediately file an appeal to the President of the United States.

Several thousand such appeals directly to the President must, without question, have the effect of stimulating the required action favorably. It must be remembered that most medical schools begin not later than October 1. Delayed action, even if favorable, will result in much confusion and derangement.

ISADORE SANDOCK, South Bend, Ind.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

WORKS ON MEDICAL GERMAN

To the Editor:—Will you give me the name of a small, compact work on medical German? I have a considerable number of patients of German origin, many of whom speak but little English, while, on the other hand, I speak practically no German. What I want is a pocket size German vocabulary reference work of the most commonly used medical words, so that in odd moments I may increase my German vocabulary and thus be enabled to better understand the ailments of my patients.

— —, M.D., Bismarck, N. D.

ANSWER.—

Lewis: Medical Vademecum in German and English, Philadelphia, P. Blakiston's Sons & Co., $5. (Twenty-five clinical lectures; German and English in parallel columns.)
Deutsch: Medical German, New York, J. H. Vail & Co., $1.75.
Lewin: German-English Medical Dialogue, published by Klinkhardt, Leipzig.

THE PRONE POSITION

To the Editor:—Dr. L. J. Ladinski (THE JOURNAL, Aug. 25, 1917, p. 634) says he places his patients in the "prone" position when about to operate for ectopic gestation. May I inquire why? I never knew of this posture being used.

H. D. FAIR, M.D., Muncie, Ind.

ANSWER.—This misuse of the word "prone" should have been corrected by our manuscript editors but was not. This usage is a common error. It would be rather difficult to operate on the abdomen with the patient in the prone position unless the operator was under the table. "Prone" means "lying face downward; stretched at full length on the belly" as the Century Dictionary puts it.

Health Department to Treat Drug Habitués.—Plans have been perfected by Health Commissioner Emerson of New York City whereby drug addicts wishing to be cured of their habit may apply to the department of health for treatment in one of the city institutions. Any local health board may receive the voluntary application of such addicts and many commit them to a hospital for treatment. Other city departments have assured the health department of their cooperation. The commissioner of corrections has placed several hundred beds in the Corrective Hospital at the disposal of the department of health for this purpose. Similar cooperation will be afforded by the department of charities, Bellevue and Allied hospitals, and the board of inebriety. The department of health will also examine and, if necessary, will prescribe or dispense narcotic drugs to addicts appealing to the department, provided such prescriptions or administration is necessary to protect their lives and the public safety. In no instance, however, will the department administer such drugs excepting in an emergency pending the admission of such drug addicts to an institution or pending their treatment by a physician.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ALASKA: Juneau, Sept. 4. Sec., Dr. S. P. Dawes, Juneau.
ARIZONA: Phoenix, Oct. 2-3. Sec., Dr. John Wix Thomas, 306 Goodrich Bldg., Phoenix.
CALIFORNIA: Los Angeles, Oct. 9-13. Secretary, Dr. Charles B. Pinkham, State Capitol, Sacramento.
COLORADO: Denver, Oct. 2. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.
DISTRICT OF COLUMBIA: Washington, Oct. 9-11. Sec., Dr. Edgar P. Copeland, The Rockingham, Washington, D. C.
GEORGIA: Atlanta, Oct. 9-11. Sec., Dr. C. T. Nolan, Marietta, Ga.
HAWAII: Honolulu, Sept. 10-13. Chairman, R. W. Benz, 1141 Alakea St., Honolulu.
IDAHO: Pocatello, Oct. 2. Sec., Dr. Charles A. Dettman, Burke.
ILLINOIS: Chicago, Oct. 9-11. Superintendent of Registration, Mr. F. C. Dodds, Springfield.
IOWA: Des Moines, Oct. 9-11. Sec., Dr. G. H. Sumner, State House, Des Moines.
MASSACHUSETTS: Boston, Sept. 11-13. Sec., Dr. Walter P. Bowers, Room 501, No. 1 Beacon St., Boston.
MICHIGAN: Lansing, Oct. 9-11. Sec., Dr. B. D. Harison, 504 Washington Arcade, Detroit.
MINNESOTA: Minneapolis, Oct. 2-5. Sec., Dr. Thomas S. McDavitt, Lowry Bldg., St. Paul.
MONTANA: Helena, Oct. 2. Sec., Dr. William C. Riddell, Power Bldg., Helena.
NATIONAL BOARD OF MEDICAL EXAMINERS: Chicago, Oct. 10-18. Sec., Dr. J. S. Rodman, 2106 Walnut St., Philadelphia.
NEW JERSEY: Trenton, Oct. 16-17. Sec., Dr. Alexander MacAlister, 438 E. State St., Trenton.
NEW MEXICO: Santa Fe, Oct. 8. Sec., Dr. R. K. McClanahan, East Las Vegas.
NEW YORK: Albany, Buffalo, New York City and Syracuse, Oct. 2-5. Chief, Examinations Division, Harlan S. Horner, State Education Bldg., Albany.
OKLAHOMA: Oklahoma City, Oct. 9-10. Sec., Dr. Ralph V. Smith, 502 Daniel Bldg., Tulsa.
PORTO RICO: San Juan, Oct. 2. Sec., Dr. M. Quevedo Baez, San Juan.
RHODE ISLAND: Providence, Oct. 4-5. Sec., Dr. Byron O. Richards, State House, Providence.
UTAH: Salt Lake City, Oct. 1-2. Sec., Dr. G. F. Harding, Templeton Bldg., Salt Lake City.

Medicolegal

Annulment of Marriage for Fraudulently Concealed Epilepsy

(McGill vs. McGill (N. Y.), 163 N. Y. Supp. 462)

A special term of the Supreme Court of New York, Onondaga County, holds that the plaintiff was entitled to the marriage annulment which he sought on the ground that he was induced to enter into the marriage contract by the defendant's concealing from him that she was an epileptic, and in leading him to believe, through statements to that effect, that she was in good health. The court says the parties were married, March 9, 1912. The plaintiff testified that the first time he knew that his wife had epilepsy was Dec. 12, 1912, when he was so informed by a physician; that after that time he did not cohabit with the defendant; that he continued to live with her and slept in the same room, as there were only two rooms in the apartments, and he continued to care for her until she went to the Craig Colony, April 15, 1915. It was true that there were rumors that the defendant was subject to epileptic seizures, but the plaintiff was assured by her that this was not so, and the evidence of the conversations had with her and her aunt, with whom she lived, and a visit to a physician, all pointed to the conclusion that it was the defendant's purpose, in which she succeeded, to deceive the plaintiff as to her actual condition; that after the marriage she had, from time to time, attacks which probably were epileptic seizures, and he procured at different places at which they resided and at different times the best medical advice that he could afford, and that to him was attainable; and that none of these men, until December, told him that she was subject to epileptic seizures. The plaintiff testified on cross-examination that prior to that time he thought the convulsions which the defendant had were hysterical. With reference to what occurred after the marriage to call his attention to the disease from which his wife was suffering, the court must not be too strict in extending the doctrine of constructive notice to the case of a lover zealously courting the woman of his choice, or to an anxious husband earnestly seeking to ascertain the cause of his wife's illness and to cure it. With reference to the claim that he cohabited with his wife after the discovery in December, 1912, that she had epileptic seizures, no question of construction was involved, for the court has no hesitation in finding that he did not cohabit with her at all. He cared for her as well as his circumstances permitted, and procured, as soon as he could, her commitment to a proper institution for treatment. He was under no legal duty to abandon her, but was under the legal duty of caring for her until such a time as that duty should be terminated by the action of a court of equity. In arriving at the conclusion that a court of equity should annul the marriage, the court has in mind that fortunately there were no children. The court believes that the safeguards the law has thrown around the marriage relation do not demand that this unfortunate defendant should be permitted, by her misfortune and misrepresentations and concealments, to drag down the life of the plaintiff, which was full of promise, especially when such a union, at best, would be childless, and, at worst, would produce a progeny of potential epileptics, over whose lives heredity would cast its dark shadow, which would extend even across the lives of their descendants.

Negligent Anchoring of Drainage Tube

(Talley vs. Whitlock (Ala.), 73 So. R. 976)

The Supreme Court of Alabama affirms a judgment in favor of plaintiff Whitlock, and denies defendant Talley a rehearing, in this action for the alleged negligent anchoring of a drainage tube placed in an incision made in the plaintiff's chest wall. The court says that the averment of negligence in the one count of the complaint on which the trial was had was that the defendant was a practicing physician and surgeon and as such undertook to perform a surgical operation on the plaintiff and to leave in the wound or cut made by said surgical operation a drainage tube, and that the defendant so negligently or unskilfully conducted himself in that regard that as a proximate consequence of said negligence said drainage tube became or was misplaced in the plaintiff's body and remained so misplaced for a long time, etc. It is held that the complaint was not subject to demurrer for the generality of its averment of negligence. It has been repeatedly ruled by this court that, where the facts stated in the complaint are sufficient to show the duty, and that the defendant negligently failed to do or perform this duty, it is not necessary to define the quo modo (the way) or to specify the particular acts of diligence that should have been employed in the performance of such duty. A civil action for malpractice against a physician and surgeon may be sustained, on proof of a failure to exercise such reasonable and ordinary care, diligence, and skill in respect to the duty so assumed and undertaken as physician and surgeon, such care and skill as physicians and surgeons in the same general neighborhood, pursuing the same general line of practice, ordinarily employ and exercise in a like case. But there is no rule of responsibility which requires of the physician or surgeon infallibility in the diagnosis or treatment of disease. Statements by the surgeon who subsequently removed the tube and by another surgeon who assisted him, as to the condition of the tube when taken from plaintiff's body, as that there was no attachment to the tube and no sign of any hole, etc., were admissible in evidence. The observed data were for the jury's consideration. Nor was there any error in a charge the effect of which, under the evidence, was to instruct the jury that, even though the defendant may have used the best method of anchoring the drainage tube in the first instance, yet he would be responsible for his negligent failure to exercise the reasonable and ordinary care, skill and diligence required of surgeons in the same general neighborhood, in doing the same service, that is, placing the drainage tube, as well as anchoring it, after the "best method." If the method of anchoring the tube was the best, but the defendant was negligent in the execution of that method, he would nevertheless be liable under the averment of negligence of the count,

where, after showing his duty as operating surgeon, it was averred that "the defendant so negligently and unskilfully conducted himself in that regard that, as a proximate consequence of said negligence, said drainage tube became or was misplaced in the plaintiff's body," etc. The defendant might have put the tube in the proper place and yet negligently secured it therein. The defendant asked that the jury be instructed that if it believed from the evidence that the drainage tube was misplaced in the wound or cut while the same was being dressed by the resident physician at the hospital, or after the plaintiff was removed from the hospital, a verdict should be returned for the defendant. This instruction was properly refused, for the reason that it predicated the alleged misplacement to the resident physician at the hospital, and pretermitted inquiry of the proper placement and securing of the tube in the first instance by the defendant. The subsequent act of another was no defense for any negligence chargeable to the defendant, unless that act of that other was the sole proximate cause of the injury complained of.

Coastwise Vessels Not Required to Have Physicians

(The City of St. Louis (U. S.), 238 Fed. R. 381)

The United States District Court, Southern District of New York, says that the party by whom this suit was brought fell from an upper berth and sprained her ankle. The injury was treated by the ship's steward. It was contended that, while there is no federal statute requiring a coastwise vessel to have a physician or surgeon on board, it still would be required, under the obligations resting on it as a common carrier under the common law, to carry a physician. In support of this contention, authorities were quoted to the effect that the rule may be stated to be that a carrier is bound to exercise the strictest vigilance in receiving a passenger, conveying him to his destination, and setting him down safely. The gist of an action against a carrier of passengers for injuries sustained is the breach of the duty imposed on it by law to carry safely, so far as human skill and foresight can go, the persons it undertakes to carry. But these authorities had no application to the issue in this case. They clearly refer only to the degree of care as against physical injuries, and do not impose a duty to provide medical skill in the event injuries are sustained. The party by whom this suit was brought, if she could recover, could do so only on the ground of negligent conduct on the part of the steward in treating the injured member. However, he acted in a reasonably prudent manner, applied standard remedies, and, so far as disclosure was made by the evidence, did all that a reasonably prudent man could have done under the circumstances. He was not a physician, but he did, on behalf of the ship, render such first aid as was necessary to any person injured. Hence the suit is dismissed.

Society Proceedings

COMING MEETINGS

Amer. Acad. of Ophthal. and Oto-Laryng., Pittsburgh, Oct. 29-30.
Am. Assn. Obstetricians and Gynecologists, Newark, N. J., Sept. 17-19.
American Association of Railway Surgeons, Chicago, Oct. 17-19.
American Electro-Therapeutic Association, Atlantic City, Sept. 11-13.
American Roentgen Ray Society, New York, Sept. 20-22.
Colorado State Medical Society, Colorado Springs, Sept. 25-27.
Delaware State Medical Society, Middletown, Oct. 8-9.
Indiana State Medical Association, Evansville, Sept. 26-28.
Kentucky State Medical Association, Louisville, Oct. 16-18.
Medical Association of the Southwest, Kansas City, Oct. 15-17.
Michigan State Medical Society, Battle Creek, Sept. 4-6.
Minnesota State Medical Association, St. Paul, Oct. 10-12.
Mississippi Valley Medical Association, Toledo, O., Oct. 9-11.
Missouri Valley Medical Society, Lincoln, Neb., Sept. 20-21.
Nevada State Medical Association, Reno, Oct. 18-19.
New Mexico Medical Society, Las Cruces, Oct. 4-6.
Pennsylvania State Medical Society, Pittsburgh, Sept. 24-27.
Utah State Medical Association, Salt Lake City, Sept. 12-13.
Vermont State Medical Society, Barre, Oct. 11-12.
Virginia State Medical Society, Roanoke, Oct. 23-26.
West Virginia State Medical Association, Fairmont, Oct. 2-4.
Wisconsin State Medical Society, Milwaukee, Oct. 3-5.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Insanity, Baltimore

July, LXXIV, No. 1

1 Recent Trends in Psychiatry. C. G. Wagner, Binghamton, N. Y.—p. 1.
2 Nature and Function of Neuroglia. C. Ricksher, Kankakee, Ill.—p. 15.
3 *Relationship Between Syphilis of Nervous System and Psychoses. Analysis of Cases Showing Divergence in Clinical and Serologic Pictures. L. G. Lowrey, Boston.—p. 25.
4 *Diagnostic Value of Spinal Fluid and Wassermann Tests in Psychiatry. E. W. Fell, Elgin, Ill.—p. 41.
5 Paranoid Types in Syphilitic Disease of Central Nervous System. E. M. Auer, Indianapolis.—p. 53.
6 Ephebic Psychosis. A. B. Evarts, Washington, D. C.—p. 61.
7 Criminal Insane and Insane Criminals. P. E. Bowers, Michigan City, Ind.—p. 77.
8 Cranial Asymmetry. H. M. Adler, Chicago.—p. 89.

3. **Relationship Between Syphilis of Nervous System and Psychoses.**—Of about 2,500 cases examined in the last three years, Lowrey finds eleven sufficiently unusual to be reported. Of these, four had clinical pictures of dementia praecox; one of constitutional inferiority, and one imbecility; two organic and three paresis. In two cases of dementia praecox, the serology of neurosyphilis was found early; in the other two, only after many years; in all four it was not expected. One patient has tabetic symptoms, the others no symptoms of neurosyphilis. The patient with tabetic symptoms also exhibits catatonic symptoms. One "hysterical" or "constitutionally inferior" person developed secondary syphilis five years before death. A year before death, the serology of neurosyphilis was demonstrated. Necropsy confirmed this. No clinical symptoms. An "imbecile" developed genuine paresis in the hospital. Necropsy and serology typical. An "organic" case without signs of paresis gives the serology of it. A case, clinically Huntington's chorea, gives the serology of paresis, without clinical signs of it. One case, clinically paresis at first, seems now like dementia praecox. Serology positive. One case, clinically paresis, has run an extremely long, stationary course. Wassermann negative in blood and fluid; other tests positive. One case, clinically and serologically paresis, has as the most prominent symptom, and the only one at the present time, auditory hallucinations. Lowrey says that these are cases with (*a*) neurosyphilis in unusual causal relationships or (*b*) coincident psychoses and symptomless neurosyphilis. He advises that diagnoses should be based on both clinical and laboratory findings.

4. **Diagnostic Value of Spinal Fluid and Wassermann Tests in Psychiatry.**—At Elgin State Hospital, 500 patients in whom paresis was for one reason or another suspected, have been given serum and fluid Wassermann tests, globulin tests and cell counts. Of these 215 were syphilitic psychoses and 285 nonsyphilitic psychoses. The gold chlorid test was not used. In cases of taboparesis and cerebrospinal syphilis the findings were less constant than in paresis. In paresis the tests failed in establishing the existence of paresis as follows: globulin increase 2 per cent., pleocytosis 10.5 per cent., serum Wassermann 7 per cent., fluid Wassermann 4 per cent. In the nonsyphilitic psychoses the tests were positive as follows: globulin increase 5.5 per cent., pleocytosis 3.5 per cent., serum Wassermann 9.5 per cent., fluid Wassermann none. Cell and globulin increase in nonsyphilitic psychoses was found especially in organic cases where a differentiation was important. There is abundant evidence that positive fluid findings may occur without paresis in the primary and secondary stages, and it is probable that they occur without the mental symptoms of paresis in the "prepsychotic" stage. It is not argued by Fell that a positive spinal fluid Wassermann is of itself conclusive evidence of paresis, nor that a negative test excludes paresis, but it is so constantly positive in the one and negative in the other that it is of the greatest value, in a case where a differentiation must be made, in distinguishing between a syphilitic and a nonsyphilitic psychosis. Fell found that the extent of the paretic process cannot be deter-

mined with any degree of accuracy by laboratory tests; it can only be said in a general way that globulin and cell increase seem more marked in the more rapid cases. The distinction between a paretic process and a tertiary syphilitic process, or the extent to which each is present, cannot be determined in the laboratory. The gold chlorid test is of some help in this direction but the therapeutic test is the only one of much value. The diagnosis of the combination of paresis with a functional psychosis should be made with extreme caution. In making a diagnosis of recovery in a case of paresis which has cleared mentally the following conditions should be considered: 1. A functional psychosis in the primary or secondary stages of syphilis. 2. A functional psychosis in the "prepsychotic" stage of paresis. 3. A remission in paresis. The first two occur quite infrequently, the last very frequently, the spinal fluid findings remaining positive.

American Journal of Medical Sciences, Philadelphia

August, CLIV, No. 2

9 *Etiology of Sprue. B. K. Ashford.—p. 157.
10 *Toxins and Serologic Reactions in Sprue. C. Michel, San Juan. —p. 177.
11 *Disinfection of Drinking Water. H. D. Dakin and E. K. Dunham, New York.—p. 181.
12 Indications for and Dangers of Tonsillectomy. G. B. Wood, Philadelphia.—p. 188.
13 Achylia Gastrica. M. H. Gross and I. W. Held, New York.—p. 196.
14 Indications for Blood Transfusion. G. M. Dorrance, Philadelphia. —p. 216.
15 *Diabetes Insipidus; Report of Case. J. H. Barach, Pittsburgh. —p. 220.
16 *Metastasis of Tumors. D. Symmers, Bronxville, N. Y.—p. 225.
17 *Differential Diagnosis of Mediastinal Conditions. A. McN. Blair, Southern Pines, N. C.—p. 240.
18 Significance of Ureteral Tubercle Bacilluria. E. Beer, New York. —p. 251.
19 *Albuminuria and Hematuria Following the Administration of Hexamethylenamin. J. R. Wiseman.—p. 264.
20 Tuberculous Peritonitis. B. Z. Cashman, Pittsburgh.—p. 269.

9. **Etiology of Sprue.**—The object of this paper is to demonstrate that the species of Monilia first described by Ashford in March, 1915, is the determining etiologic factor in sprue, and to suggest that this species be recognized as Monilia psilosis, Ashford, 1914. A summary is given of a study of 100 persons examined clinically, mycologically and serologically for sprue. Sixty-seven were suffering from or had suffered from clinical sprue, and one was either a carrier or had mild sprue. Thirty-two were healthy or were suffering from other diseases than sprue. In sixty-one of the sixty-eight sprue cases Monilia psilosis was isolated. Of the seven in which it was not found, four had been cured for at least one or two years and gave only a 50 per cent. Wassermann positive for Monilia psilosis. The other three were mild chronic cases, one with a + (25 per cent.) Wassermann and the other two with a + reaction. Seventy-one persons gave a positive deviation of the complement with an antigen of Monilia psilosis, all but one of the cases of clinical sprue and four not sprue—a case of pellagra, a case of nervous dyspepsia, a case of bacillary enterocolitis and one a healthy boy with an ulcer of the leg.

10. **Toxins and Serologic Reactions in Sprue.**—Out of over 400 tests made, including various diseases, all cases which were diagnosed clinical sprue and from which the Monilia psilosis was isolated from the tongue and feces, the complement-fixation test was positive. The other Monilia antigens used have faintly positive results only in severe cases of sprue. In these tests the results with other Monilia antigen was about 15 per cent. positive, while the reaction with the psilosis antigen was 100 per cent. positive. This reaction varies with the condition of the patient. In cases of chronic or latent sprue, and in cases which had recovered, the reaction tends to become negative. In cases which had clinical syphilis and sprue, the fixation test for both these diseases was positive. Guinea-pig serum of an animal which had been inoculated with a killed culture of Monilia psilosis gave a strong positive reaction. The serum from animals which had been inoculated with live cultures or killed cultures of Monilia psilosis gave the same results as the serum of patients that have sprue, and from which the Monilia psilosis had been isolated from tongue and feces. In view of these results and with Ashford's clinical and mycological work Michel says it is strongly evident that the Monilia psilosis of Ashford is the etiologic factor in sprue.

11. Abstracted in THE JOURNAL, June 30, 1917, p. 2008.

15. **Diabetes Insipidus.**—Barach reports a case of diabetes insipidus with kidneys capable of eliminating a normal amount of solids in the twenty-four hours. In response to ingestion of added amounts of salt and urea the kidneys show ability to eliminate these substances promptly and to concentrate urine. In response to the ingestion of a gram of glucose the urine showed a trace of sugar and a diuresis followed. Phenolsulphonephthalein elimination was normal. There were evidences in this case suggesting that the abnormally large liquid exchange was not limited to the kidneys, but that the spinal fluid and saliva were likewise secreted in abnormally large amounts. It was demonstrated that although the kidneys and salivary glands were already performing an inordinate amount of work, as far as excretion of water is concerned they were not functioning to their maximum capacity. Pilocarpin produced a sialorrhea and diuresis after each dose on several days. Circumstances did not permit any attempt at determining the part played by the internal secretions in this case, nor was it possible to make any observations toward determining the part played by the glossopharyngeal nerve in the polydipsia.

16. **Metastasis of Tumors.**—Among 5,155 necropsies at Bellevue Hospital in the past ten years there were 298 malignant tumors; 264, or 89 per cent., were of the epithelial or mesothelial variety, and 34, or 11 per cent., were sarcomatous or endotheliomatous. Two hundred and twenty, or 74 per cent., had gone to the stage of metastasis; in 19 instances, or 7 per cent., there was indirect invasion of neighboring tissues without attendant metastases in remote parts, and in 59 cases, or 19 per cent., the growths remained localized as follows: epithelioma of the urinary bladder 7, of the tongue 4, of the cheek and bronchus 1 each, of the esophagus 7, carcinoma of the stomach 10, of the sigmoid 6, of the cecum 5, of the uterus 3, of the rectum, pancreas and liver 2 each, of the bile ducts and breast 1 each, sarcoma of the lung and osteosarcoma of the vertebrae 1 each, hypernephroma of the kidney 3, and of the suprarenal 1. The primary growths were distributed thus: epithelioma of the esophagus 23, of the urinary bladder 12, of the tongue 5, of the branchial clefts, bronchi, skin and larynx 2 each, of the pharynx and penis 1 each, carcinoma of the stomach 84, of the gallbladder 16, of the prostate 12, of the bile ducts 6, of the cecum 10, of the duodenum 3, of the pancreas 10, of the uterus 11, of a salivary gland and the jejunum 1 each, of unknown origin 2; hypernephroma of kidney 12, of suprarenals 3; lymphosarcoma of the retroperitoneal nodes 4, of the anterior mediastinal nodes 3, of the posterior mediastinal nodes 2, of the cervical nodes 2, of the gastro-intestinal lymphoid structures 2, of general distribution 1; sarcoma of the breast 1, of the retroperitoneal nodes and perioesteum 2 each; of the humerus cervical nodes, sole of foot, thigh, mesenteric nodes, lung and kidney 1 each; osteosarcoma of right leg, left leg, vertebrae 1 each; multiple myelogenous sarcoma 2, melanoma 1. Of the 298 tumors the lymph nodes were metastasized 131 times, or in 44 per cent.; the liver 102, or in 34 per cent.; the pleura and lungs 73, or in 25 per cent.; the bones in 35, or 17 per cent.; the vertebrae, ribs, calvarium, sternum, femur, humerus, and pelvis being involved in the order named; the suprarenals were metastasized 23 times, or in 8 per cent.; the kidney 17 times, or in 5.7 per cent.; the spleen 16 times, or in 5.3 per cent.; there was neoplasmic invasion of large veins in 13 cases, or in 4.7 per cent.; the pancreas was metastasized 13 times, or in 4.7 per cent.; the heart muscle 9 and the skeletal muscles 3 times, or in 4 per cent.; the ovary, mesentery, pericardium, and dura mater 7 times each, or in 2 per cent.; the small intestine, stomach and scalp 3 times each, and the testicle and esophagus once each.

17. **Differential Diagnosis of Mediastinal Conditions.**—The uniform method of checking all physical examinations of the chest in doubtful cases with the fluoroscope or Roentgen-ray plates is commended by Blair as the only means which will

lead to more accurate and early diagnosis of mediastinal conditions.

19. **Albuminuria and Hematuria Following Administration of Hexamethylenamin.**—A study of Wiseman's cases shows that the most important cause of albuminuria or hematuria following the administration of hexamethylenamin is abnormally high urinary acidity. In four out of the five reported cases the acidity was above 100 in terms of decinormal sodium hydrate, and in one case it reached 140. It is therefore necessary to carefully determine the urinary acidity of all patients who are taking hexamethylenamin. If the acidity becomes too slow or disappears entirely the drug is inefficient, whereas with a high degree of acidity, irritative symptoms are likely to appear. High dilution of the urine impairs the formaldehyd action; concentration of the urine increases formaldehyd activity, but favors unpleasant results.

Boston Medical and Surgical Journal

August 9, CLXXVII, No. 6

21 Country Doctor and Hospital. N. W. Faxon, Stoughton.—p. 167.
22 *Study of Urines of Picric Acid Workers. F. O. West, Woburn. —p. 171.
23 Epidemic of Dysentery at Boston State Hospital, Due to Member of Paratyphoid-Enteritidis Group. M. E. Morse and G. Tryon, Boston.—p. 173. (To be continued.)
24 Year's Work with Wassermann Test, in Boston Health Department Laboratory, with Especial Reference to Doubtful Reactions. F. H. Slack, P. Castleman and K. R. Bailey, Boston.—p. 180.

22. **Study of Urines of Picric Acid Workers.**—The result of West's investigation tends to show that picric acid may be manufactured without great hazard to the employee, provided the work is carried on under proper conditions and the men are subjected to rigid medical supervision. Of eighty-six urines examined for the presence of albumin, three gave the "slightest possible trace" at the end of employment, whereas it was not detected at the outset. Nevertheless, these three men had never been affected by any of the substances they were handling; while many men not given the test had been repeatedly treated, one of this latter class having nearly died from the effects of fume poisoning. In addition to the examination for albumin, fifty-seven of these urines were tested for the presence of picric acid, and three were positive.

Cleveland Medical Journal

August, XVI, No. 8

25 Diagnosis and Treatment of Congenital Pyloric Stenosis. C. G. Grulee and D. D. Lewis, Chicago.—p. 527.
26 *Electric Hypothesis of Exhaustion. G. W. Crile, Cleveland.—p. 540.
27 Incipient Scurvy. D. J. M. Miller, Atlantic City, N. J.—p. 541.
28 Medical Examination and Aviation Corps. W. B. Chamberlin, Cleveland.—p. 545.
29 Headache of Ocular Origin. W. E. Bruner, Cleveland.—p. 549.
30 Removal of Watermelon Seed from Trachea of Eighteen Months Old Child. W. B. Chamberlin, Cleveland.—p. 553.

26. **Electric Hypothesis of Exhaustion.**—The following theory is propounded by Crile: Exhaustion from any cause is the state in which electric energy is not present; is not being generated; or, if generated, is prevented from being utilized. Thus, if the skin is widely excised; if viscera are widely exposed; if burns destroy the epidermis—the electric energy of the body cannot be utilized, as with the destruction of nonconducting epidermis, the electric energy is dissipated before it can be used, and exhaustion results. For a similar reason, exhaustion in greater or less degree results from immersion in a warm, moist atmosphere, or in water, the electricity of the body being conducted away from the body more rapidly than it can be fabricated. If the stored electric energy is discharged or drained by extreme or prolonged exertion, by emotion, by infection, or by prolonged consciousness—deprivation of sleep—then exhaustion results. If the acid-eliminating organs, the lungs, the liver and the kidneys, are interfered with by injury or disease, then the generation of electric energy is interfered with and polarization—exhaustion—results.

Illinois Medical Journal, Chicago

August, XXXII, No. 2

31 More Common Surgical Emergencies in Urogenital Tract and Their Management. F. Kreissl, Chicago.—p. 77.
32 Specificity and Nonspecificity of Vaccines. D. J. Davis, Chicago. —p. 84.
33 Vaccines for Prophylaxis. G. F. Ruediger, La Salle.—p. 87.
34 Vaccine Therapy in Typhoid Fever. S. R. Slaymaker, Chicago. —p. 92.
35 Vaccines in Pertussis. H. W. Cheney, Chicago.—p. 94.
36 Timeliness in Application of Radium. A. Woelfel, Chicago. —p. 97.
37 Roentgen Diagnosis of Syphilitic Lesions. E. S. Blaine, Chicago. —p. 100.
38 Fractures of Pelvis and Resulting Injuries to Urethra and Bladder. H. C. Mitchell, Carbondale.—p. 104.
39 Operation for Cystocele by Abdominal Route. W. L. Gray, Champaign.—p. 108.
40 Rôle of Prostate in Acute Gonorrheal Infections. B. D. Baird, Galesburg.—p. 109.
41 Physician and Proof of Death or Disability for Insurance Company. C. U. Collins, Peoria.—p. 111.
42 Cesarean Section. H. M. Orr, LaSalle.—p. 116.
43 One Step Further in Treatment of Acidosis in Children. H. C. Blankmeyer, Springfield.—p. 119.
44 "Lest We Forget," or Dr. Crawford W. Long, the First Anesthetist. C. H. Johnson, Champaign.—p. 122.
45 Etiologic Study of Acute Arthritis. W. R. Rainey, East St. Louis.—p. 129.

Medical Record, New York

August 11, XCII, No. 6

46 Neurotization of Paralyzed Muscles by Implantation of Motor Nerves. J. C. A. Gerster and W. C. Cunningham, New York. —p. 223.
47 Etiology and Treatment of Hemorrhoids. J. R. Pennington, Chicago.—p. 225.
48 Hay Fever and Its Relation to One Hundred of Most Common Plants, Trees and Grasses. W. Scheppegrell, New Orleans.—p. 230.
49 Case of Bilateral Cystic Degeneration of Kidneys. L. Wender, Corozal, Canal Zone.—p. 236.
50 Use of Small Doses of Pituitary Extract for Inducing and Shortening Labor at Term. A. Stein, New York, and H. Dover, Ottawa, Canada.—p. 238.
51 Auricular Education of Deaf Children. J. D. Wright, New York. —p. 241.

Michigan State Medical Society Journal, Grand Rapids

August, XVI, No. 8

52 Differential Diagnosis Between Functional and Organic Cardiac Murmurs. C. H. Johnston, Grand Rapids.—p. 337.
53 Rural Surgery. J. A. Reeder, Clare.—p. 342.
54 Paraffin Treatment of Burns. O. H. Cox, Sault Ste. Marie.—p. 344.
55 Brain Lesions—Report of Cases. L. P. Parkhurst, Grand Rapids. —p. 347.
56 Case of Bullet Wound of Penis, Abdominal Wall and Stomach. C. A. Van Dusen, Ogden Center.—p. 352.
57 *Rôle of Streptococcus in Recent Epidemic of Acute Respiratory Infections. H. H. Cummings, Ann Arbor.—p. 354.
58 Indications and Contraindications in Treatment of Hare Lip and Cleft Palate. R. H. Baker, Ann Arbor.—p. 365.
59 Correlation of Roentgenographic and Surgical Findings in Sixty-Two Operated Cases. J. G. Van Zwaluwenburg, Ann Arbor. —p. 370.
60 Case of Typhoid Spine. W. H. Gordon, Ann Arbor.—p. 378.

57. **Rôle of Streptococcus in Recent Epidemic of Acute Respiratory Infections.**—The total number of cases of acute rhinitis, pharyngitis and tonsillitis treated by the University of Michigan Health Service during four years was 7,056. Of this number 172 cases developed a middle ear infection or a percentage of 2.4. Mastoiditis developed in fourteen and ten of these came to operation. Two of these cases were found to have sinus thrombosis. In the series of 1,600 cases of tonsillitis, thirty-four, or 2 per cent., developed joint complications involving most frequently the ankles and elbows. Three cases occurred in patients having a streptococcus tonsillitis associated with a scarlet rash. Two of these cases proved fatal. Acute polyarthritis was observed in twelve of the thirty-four cases. Experience has firmly fixed in the author's mind the idea that acute flareups of chronic tonsillitis usually precede the arthritis involvement. The frequency with which recurring attacks of rheumatoid symptoms in students having chronic tonsillitis occur, and the absolute disappearance after tonsillectomy, strengthens belief that these are manifestations of streptococcic activity in the joints and muscular system. Of the thirty-four arthritis cases, eight, or 23 per cent., developed cardiac complications. Following throat infections without arthritic complications the following lesions have been diagnosed: mitral insufficiency, fifty-three cases; aortic insufficiency, eleven cases; mitral stenosis, four cases; aortic stenosis, four cases. Brain and nervous system complications, such as meningitis and neuritis have not been met, however, delirium and extreme alertness and irritability

have been observed in many cases during the acute stage. In four fatal septicemias this marked irritability has been the first indication of invasion of the blood stream. Cummings considers it a very valuable prognostic sign. Pulmonary complications have been few; only seven cases of bronchopneumonia developed after these acute respiratory infections. Two students had pulmonary hemorrhages during this epidemic. Tubercle bacilli were found in the hemorrhagic sputum although subsequent physical examination and Roentgen examination failed to disclose the area involved. Among 1,600 cases of tonsillitis thirty cases of nephritis were observed, or 1.8 per cent. Two of this number were of the acute hemorrhagic type. Acute parenchymatous nephritis was the more common. Two students died from appendicitis and peritonitis of streptococcic origin.

New Jersey Medical Society Journal, Orange

August, XIV, No. 8

61 Postoperative Treatment.—A. J. Ochsner, Chicago.—p. 297.
62 Relation of Appendicitis to Certain Cases of Cyclic Vomiting; Report of Six Cases. M. Runyon, South Orange.—p. 303.
63 State's Insane. B. D. Evans, Morris Plains.—p. 308.
64 Weak Foot; Its Stages and Treatment. C. R. Keppler, Newark. —p. 313.

Psychiatric Bulletin, Utica, N. Y.

April, II, No. 2

65 *Decline of Alcohol as Cause of Insanity. H. M. Pollock.—p. 102.

65. **Decline of Alcohol as Cause of Insanity.**—The evidence herein presented by Pollock of the general decline of alcohol as a cause of insanity in New York state shows that the alcoholic cases annually admitted since 1909 have decreased both relatively and absolutely, and intemperance as a contributing factor in causing mental disease has gradually diminished.

Southern Medical Journal, Birmingham, Ala.

August, X, No. 8

66 Etiology of Poliomyelitis. H. Greeley, Brooklyn.—p. 621.
67 Minor Complaints of Children. S. S. Adams, Washington, D. C. —p. 624.
68 Treatment of Average Case of Tuberculosis. J. J. Lloyd, Catawba Sanatorium, Va.—p. 628.
69 *Emetin Hydrochlorid: Its Intravenous Administration. J. W. Larimore, St. Louis, Mo.—p. 633.
70 Chronic Degenerative Diseases: Their Prevalence, Causes and Prevention. J. P. Munroe, Charlotte, N. C.—p. 637.
71 Malaria Survey: Impounded Waters, Biting of A. Punctipennis on Porches, Distance of Flight of A. Quadrimaculatus. J. A. LePrince and T. H. D. Griffiths, Washington, D. C.—p. 642.
72 What South is Doing for Control of Cancer. C. E. Lakeman, New York.—p. 644.
73 Urgent Need of Hospital Facilities for Tuberculous Negroes. M. F. Sloan, Towson, Md.—p. 654.
74 Protean Manifestations of Appendicitis. F. G. DuBose, Selma, Ala.—p. 663.
75 Wrist-Drop from Traumatic Adhesions about Nerve Trunks; Report of Two Cases. C. S. Venable, San Antonio, Tex.—p. 664.
76 Surgical Physiology of Spleen. E. G. Jones, Atlanta, Ga.—p. 665.
77 Torsion of Fallopian Tube Resulting from Small Ovarian Cyst. J. W. Holland, Baltimore.—p. 670.
78 Malaria as Factor in Military Efficiency. F. L. Hoffman, Newark, N. J.—p. 676.
79 First Aid to Injured; With Particular Reference to American Red Cross. O. M. Marchmann, Dallas, Tex.—p. 680.
80 Author's Muscle Shortening Operation. H. H. Briggs, Asheville, N. C.—p. 686.
81 Chancre of Bulbar Conjunctiva. E. W. Carpenter, Greenville, S. C.—p. 695.

69. **Emetin Hydrochlorid: Its Intravenous Administration.**—Larimore has used emetin intravenously in the treatment of amebic dysentery during the past year, using 1 grain at each injection. The injections were given quickly and in one milliliter of fluid. In one nonendamebic case in which the drug was used for a therapeutic test there was after twenty-four hours a severe attack of vomiting and diarrhea. This could not necessarily be ascribed to the injection. This case had a hypertension of 180 millimeters and an occasional intermittent pulse. The symptoms, however, were apparently gastro-intestinal rather than circulatory, unless perhaps there was a circulatory element in the vomiting. After several injections there was noted in a few cases an arterial hypotension. A few cases gave no subjective reaction until after several doses, suggesting an accumulative action. The results obtained in eleven cases cited were such as to indicate that the treatment is safe as well as satisfactory.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

Brain, London

May, XL, No. 1

1 *Experimental Toxi-infection of Central Nervous System. D. Orr and R. Rows.—p. 1
2 *Dissociation of Visual Perceptions Due to Occipital Injuries, with Especial Reference to Appreciation of Movement. G. Riddoch. —p. 15.
3 *Progressive Atrophy of Globus Pallidus. J. R. Hunt—p. 58.

1. **Experimental Toxi-Infection of Central Nervous System.**—This communication is a continuation of experimental work on the action of the bacterial poisons on the nervous system. The present research has been directed toward the brain. A capsule containing a culture of the *Staphylococcus aureus* was placed in contact with the common carotid artery in the neck. The experiments have given positive results so far. They help to explain the pathogenesis of certain obscure lesions of the central nervous system found in man. Hyaline thrombosis was found to be a constant result in the cords examined when the capsules were placed in the abdominal cavity, and the same morbid change is found in the vessels of the brain when the capsule is placed against the carotid sheath. The lesions present are the direct result of this thrombotic change, and vary in kind with the degree to which the local vascular supply is interfered with. Orr and Rows examined three brains and observed two types of lesion. 1. Coagulation necrosis of the nerve cells in the cornu ammonis, in the cerebral cortex, and in the amygdaloid nucleus. 2. Softening in the stratum moleculare of the cornu ammonis. They also found that there is a difference in the two vascular systems which subserve the grey and white matter respectively. The evidence of this is seen in the histologic difference between the cortical and subcortical lesions. The former are diffuse and consist in necrosis of the nerve-cell units; the latter—in the cornu ammonis—involve a circumscribed locality and are typical of infarction. The two types of lesion observed by the authors illustrate how the two factors, degree and situation, can produce dissimilar pathologic results, although the pathogenesis is the same; and applying this to clinical neurology, it becomes apparent that certain nervous syndromes, though widely different in symptomatology, are pathogenetically one and the same disease. The difference in symptomatology is in large measure due to the anatomical site of the lesion; but the degree to which the nerve structures are involved is an equally important factor. Toxic hyaline thrombosis of capillaries or even larger vessels can contribute very largely in the production of nervous lesions of different degree.

2. **Dissociation of Visual Perception Due to Occipital Injuries.**—Reviewing the results of examination of cases showing visual defects from occipital injuries, Riddoch summarizes his work as follows: (*A*) With regard to the appreciation of movement when an object is oscillated in the so-called blind field. (1) That movement should be given a place among the stimuli which are recognized as originating visual perception. (2) That light and movement are the first stimuli to be appreciated in a recovering visual field. And since the appreciation of both returns *pari passu*, and since the field for light cannot be recorded on a chart, while that for movement can, the fields for movement, charted at intervals, give the earliest indications of recovering vision. (3) That the presence of dissociation between the fields for appreciation of movement and recognition of an object afford a valuable aid in prognosis. In cases in which movement is perceived in the affected field, there will be some return of vision; on the other hand, where no movement is perceived after an interval of some months has elapsed the affected field will probably be permanently blind. (4) That recovery for the appreciation of movement begins at the periphery of the field, and extends inward toward central vision. (*B*) That the types of visual dissociation exhibited are analogous to the dissociations of general somatic sense impressions described by Head and his co-workers as occurring from

cerebral injuries. (*C*) That in certain of the cases a consideration of the probable damage to the brain along with the charts of the visual fields yields facts which support the contentions of Holmes and Lister on cortical representation of the retina. (1) That macular vision has its center in the posterior part of the visual area. (2) That the macula, like the rest of the retina, is not represented bilaterally in the cortex. (3) That the cortical center of the peripheral zones of the retina is in the anterior part of the area striata. (4) That the superior quadrants of each retina are represented in the upper, and the inferior quadrants in the lower parts of each visual area.

3. See THE JOURNAL, June 17, 1916, p. 2034.

British Medical Journal, London

July 28, II, No. 2952

4 Tropical Medicine and Hygiene. P. Manson.—p. 103.
5 India and Medical Progress. R. McCarrison.—p. 109.
6 *Treatment of Scabies by Chlorin Gas. G. H. Clark and H. S. Raper.—p. 113.
7 Anaphylactic Shock After Injection of Serum Intravenously. C. A. Patrick.—p. 114.
8 Grave Diabetes Mellitus with Pulmonary Tuberculosis Following Mumps. F. B. Gilhespy and H. S. Holden.—p. 115.

6. **Treatment of Scabies by Chlorin Gas.**—Seventy-four cases of scabies were exposed by Clark and Raper to a concentration of one to two parts of chlorin per thousand of air (by volume), the service gas helmet being worn as a protection. The exposures were of five minutes' duration and occurred on successive days. Usually four exposures were given, but in some instances this number was exceeded. The patients had a hot bath before their first treatment and wore ordinary hospital clothing. At the first exposure the bedding was placed in the "gassing" chamber. The officers wore a box respirator as protector, and were exposed to a concentration between two and three parts of chlorin per thousand of air. The exposure lasted twenty minutes. A bath was taken on the morning of the first day of treatment and not again, except in one case, until the day after the last exposure of gas. The number of exposures given and the intervals between them were varied in order to find out the best conditions of treatment. A few of the patients were given four exposures on successive days, and then, after two days' interval, two more exposures on successive days. Others received two exposures on the first two days, then, after two days' interval, two further exposures on successive days. Three of the officers were given two exposures on the first two days, and then, after three days' interval, one more exposure only. On the first day of treatment the officers' underclothing, sleeping garments, and gloves were exposed to the gas, and clean bed linen was ordered the same night. The clothing was exposed for twenty minutes. The treatment of both officers and men was carried out in rooms with about a thousand cubic feet of air space. Chlorin was delivered into this from a cylinder, and it was found, after very little practice, that an approximation to the concentration desired could easily be obtained. Nearly sixty noncommissioned officers and men were treated under somewhat unsatisfactory conditions. Of the whole number, not more than 25 per cent. were cured. Many of the cases not definitely cured showed much improvement. Of fourteen officers treated, eleven were cured and three much improved. One feature of the treatment which was noted in officers, noncommissioned officers, and men was the production of a very irritable condition of the skin, especially about the scrotum and axillae, in some of the cases. It was most marked in cases which may be termed chronic, and which had been treated by sulphur in one form or another for varying periods without cure, and also more noticeable in the cases which were given more than four exposures.

Journal of Laryngology, Rhinology and Otology, London

July, XXXII, No. 7

9 Clinical Records from Provincial Hospital. N. Maclay. (To be continued).—p. 210.
10 Abscess of Nasal Septum of Six Years' Duration. J. B. Horgan. —p. 215.

Lancet, London

July 28, II, No. 4900

11 Fatigue and Alcohol. A. F. S. Kent.—p. 107.
12 Fallacies of Relying Solely on Agglutination Tests for Diagnosis of Typhoid in Antityphoid Inoculated Individuals, with Special Reference to Use of Dreyer's Method. R. P. Garrow.—p. 112.
13 Technic of Condenser Testing in Nerve Injuries. F. Hernaman-Johnson.—p. 117.
14 War Nephritis. F. C. Davies and R. P. Weldon.—p. 118.
15 Extension Splint for Ambulatory Treatment of Fractures of Femur. N. B. Taylor.—p. 120.
16 Case of Second Cesarean Section in Same Patient. H. M. Dowler. —p. 122.
17 Rupture of Tubo-Uterine Gestation; Excision of Sac. W. G. Nash. —p. 122.
18 "Needle Wing Grip" for Intramuscular Injections. C. F. White. —p. 124.

August 4, II, No. 4201

19 Meat Inspection, with Special Reference to Developments of Recent Years. W. J. Howarth.—p. 147.
20 *Microscopic Histology of Malaria as Occurring in Salonika Force in 1916. L. S. Dudgeon and C. Clarke.—p. 153.
21 *Treatment of Tuberculous Eyes by Local Application of Tuberculin. H. A. Ellis and H. M. Gay.—p. 156.
22 Drainage of Infected Hemothorax. A. Cox.—p. 159.
23 Case of Hemiplegia Following Pleural Effusion. G. deB. Turtle. —p. 161.
24 Cases of Poisoning by Sodium Nitrite and Boric Acid. H. Sinigar. —p. 162.
25 Malaria Acquired in England. A. C. D. Firth.—p. 162.

20. **Microscopic Histology of Malaria.**—Investigations were undertaken by Dudgeon and Clarke for the purpose of ascertaining the cause of death in some of the rapidly fatal cases of malaria, also whether the lesions produced were more severe than those already recorded, and the observed frequency of cardiovascular phenomena. These observations include the investigations of the cerebrum, cerebellum, medulla, heart muscle, suprarenal glands, liver, spleen, kidneys, and intestinal tract from patients who died in coma, those who died quite suddenly, and those who died with general malarial toxemia. Examination of the heart muscle in six cases of malaria showed fatty degeneration in each instance. Blocking of the capillaries with infected red cells is present in most instances. The microscopic changes in the suprarenals are very numerous. The most constant alteration from the normal histology is the diminution in the lipoid substances which give such a characteristic appearance to the normal gland. The chromaffin substance in the medulla is also greatly reduced in amount. In many of the suprarenals the deep cortical pigment is found to be abundant. Malarial pigment is present in each specimen. It is found free, lying in the suprarenal cells, in spider cells from the connective tissue framework which bounds the glandular tissue, and in large mononuclear cells in the sinuses. Necrosis of the cortical and medullary tissue is especially well marked in those cases in which there is thrombosis of blood vessels. Small parasites and spores are found in most of the glands, but they are far more numerous in some cases than in others; while in one instance crescents were present, although few in number. The cerebrum, medulla, pons and cerebellum were examined from three cases. In each case the patients died in coma. The capillaries are engorged with blood, as also the arterioles, while many of the blood vessels are thrombosed and the thrombi are composed of agglutinated red cells, partially hemolyzed red cells, and blood pigment. This pigment is taken up by the endothelial cells which are found lying free in the lumina of the vessels. In the spleen there was congestion in all cases, free hemorrhages in some, while in several instances necrosis of the splenic pulp occurred. This necrosis affects chiefly the pulp, but there is some necrosis of the Malpighian corpuscles in a few instances, while in the case of blackwater fever the necrosis of the Malpighian corpuscles is the most striking feature. The areas of necrosis contain black pigment. Thrombosis of the capillaries and arterioles in many cases is a striking feature. In the liver the deposit of pigment is present in every case. Fatty change is present, but it is only in a few cases that the fat droplets are abundant. Necrosis of liver tissue in isolated areas is of common occurrence. Parasites are found in the red cells in the sinuses and in the blood vessels, while the vessels in a section of the liver which shows thrombosis

contain numerous infected red cells in the thrombi, and also a few crescents. Changes in the kidney are similar to those of the other viscera.

21. **Treatment of Tuberculous Eyes by Local Application of Tuberculin.**—The treatment employed by Ellis and Gay consists in instilling tuberculin into the conjunctival sac directly, in various dilutions of increasing strength. The eye thus gradually acquires a permanently raised resistance to the tuberculin poison, and so becomes no longer sensitive to local tuberculin reactions, as the result of congestive conditions produced by strain or irritation. During the treatment the eye is kept uncovered, being only protected by a shade when photophobia is present. All cases have been treated with bovine tuberculin, ordinary P. T. O. being used in tenths.

Archives Médicales Belges, Paris

June, LXX, No. 6, pp. 481-576

26 The Physiologic Bases of Shock. D. Baruch.—p. 481.
27 Occupational Guidance and Reeducation of War Cripples. C. Dam. —p. 493.
28 *Venereal Diseases in the Army. J. Gaudy.—p. 509.
29 General Principles for Treatment of War Fractures. M. Stassen and J. Voncken.—p. 515. (Continuation.)
30 Medical Questions Relating to Belgian Military Refugees in Holland. R. Wybauw.—p. 569.

28. **Venereal Disease in the Army.**—Gaudy remarks that venereal diseases have spread in an appalling manner since the outbreak of hostilities. He says: "This has been observed in previous wars, but the conditions of the present war impart a character of peculiar gravity to these diseases. Today it is not two armies that are fighting, but two groups of entire nations are arrayed in battle against each other, and it is these whole nations that are feeling the effects of the evil. Among the venereal diseases syphilis represents about 20 per cent. In all classes of society the general level of morality has been lowered since the war began, and venal or lustful prostitution has developed in notable proportions." He cites Balzer's statement that up to the end of February, 1915, 30,000 cases of venereal disease had been declared among the German troops occupying Belgium. "In Italy, the Milan hospitals in eleven months had 4,861 inmates with venereal disease, and Thibierge estimates that in the French armies between 4,000 and 5,000 contract syphilis each month, that is, 50,000 or 60,000 a year, a total for the three years of war of 150,000 or 200,000 new syphilitics." In the Belgian army few statistics are available, but one service in ten months had 1,500 venereal cases, including 317 of syphilis, all but ninety-two recently acquired.

Before the war, the civil courts in estimating the incapacity for industrial labor entailed by syphilis figured it at from 15 to 25 per cent. This applies to military service as well. We know also the neurasthenia so often engendered by chronic gonorrhea. From the military standpoint therefore the venereally affected can render but a mediocre service on account of the depressing effect exerted by this kind of disease on the spirits as well as on the physical organism. Gaudy urges that while the men are under military discipline their syphilis should be combated with the utmost energy and measures taken to reduce the evil to the minimum. Italy has taken the most radical measures, aiming to reduce to the minimum the sources of contamination and to enforce thorough treatment. Uncontrolled prostitution is strictly checked, especially in the war zone, and the open houses there are kept under rigorous supervision and no civilians admitted. Official dispensaries and hospitals for venereal diseases have been installed at numerous points and compulsory courses of treatment are given to soldiers and civilians alike. "This latter is a most fortunate innovation." In France there are some similar institutions but they are not numerous, and they are left to the initiative of the army medical officer and have not been generalized. In the Belgian army, the infirmary of each division has a consulting post for venereology but there is no uniform plan, and only a few dispensaries have been established back of the war zone. But even with this, they are more numerous than in the British army which has only one for each army. "Progress can come only by multiplying and unifying the antivenereal institutions and enlightening the men." The number of infections in the war zone proper is comparatively small, and Gaudy does not think it wise or desirable to suggest the creation of public houses in the war zone like those of the Italian army, or those organized back of the German armies, and by the Japanese on the campaign in Manchuria.

Archives Mensuelles d'Obstétrique et de Gynécologie, Paris

July 15, VI, No. 4-5-6, pp. 97-192

31 *Modifications in the Antitryptic Power of the Blood Serum in Pregnant Women. G. Ecalle.—p. 97.
32 *Fat and Lipoid Content of the Serum of Pregnant Women. G. Ecalle.—p. 128.
33 *The Reactions Resulting from the High Fat and Lipoid Content of the Serum of Pregnant Women.—G. Ecalle.—p. 139.
34 *Sudden Death a Day or So After an Apparently Successful Operation. A. Brindeau.—p. 159.
35 Advantages of Erodium Cicutarium as Means to Arrest Uterine Hemorrhage. J. A. von Dongen (Amsterdam).—p. 169.

31. **The Antitryptic Power of the Serum of Pregnant Women.**—Ecalle devotes over thirty pages to his study of the serum of pregnant and nonpregnant women in respect to its power of checking the digestion of albumin by trypsin. This power is augmented in pregnant women but does not reach an appreciable degree until the fourth or sixth month; it then keeps high and for two weeks after delivery, and is highest in case of pregnancy intoxication. The index outside of pregnancy averages about 46. In the first two months of pregnancy it may be normal or rise to 50; by the third or fifth month it averages 65, and in the four last months, 77. In two pregnant women at the sixth month the index was 85 and 90. There is too little constancy in these findings for the antitryptic power alone to serve as the basis for assumption of a pregnancy. He explains it as the antibody reaction to the penetration into the maternal blood of tryptic ferments from the placenta.

32. **Fats and Lipoids in the Serum of Pregnant Women.**—The cholesterin in the serum showed likewise a gradual increase as the pregnancy advanced.

33. **Reactions from the High Lipoid Content of the Serum in Pregnant Women.**—Ecalle has not studied the Neumann and Hermann reaction in the serum of pregnant women but, judging from analogy, does not think it can be of much diagnostic value. The same can be said of the activation of cobra venom by the serum of pregnant women. This reaction he has studied extensively, and found it progressively more and more pronounced in pregnant women. It seems to be caused merely by the increased proportion of lecithin in the serum of the pregnant, and hence is not specific to pregnancy. At the same time, this reaction is so distinct and it appears so early—by the beginning of the third month—that it may aid in the diagnosis of pregnancy in dubious cases. Before heeding the findings, however, we must exclude tuberculosis, cancer and most infectious diseases and affections of the nervous system. In short, his final conclusion is that notwithstanding their great biologic interest, this and the other reactions studied do not have much practical import.

34. **Sudden Postoperative Fatalities.**—Brindeau refers to the sudden death a day or two after an apparently successful operation, when the patient seems to have entirely recovered from the shock. Such fatalities have been ascribed to the anesthetic, to insufficiency of kidneys or liver, to embolism, pleural adhesions, myocarditis, meningeal hemorrhage or acute sepsis. Even when necropsy was possible, the true cause of death was often left a mystery. Of late, literature has been accumulating on suprarenal insufficiency as responsible for these postoperative fatalities. With chronic suprarenal disease, it is easy to understand that the anesthetic might break down the already damaged suprarenals beyond recuperation. He reports in detail a case of this kind, the woman of 36, apparently healthy, came to the clinic for suture of an old laceration of the perineum. The minor operation was borne apparently perfectly but the woman died suddenly in the night and necropsy disclosed chronic tuberculous disease in both suprarenals which had evidently entailed acute insufficiency under the chloroform. One supra-

renal weighed 16 and the other 7 gm.; both were almost completely destroyed by the tuberculosis. Savariaud has reported a case in which a child of 8 died the sixth day after general anesthesia and both suprarenals were found the seat of a large hematoma. The liver in these cases also shows signs of having suffered, and the thyroid and the pituitary were always congested, but these changes are like those that have been encountered from the action of chloroform alone.

If the patient had been examined for suprarenal insufficiency before the operation, testing for white dermographism, the suprarenal white line, and for unduly low blood pressure, it might have been possible to have been forewarned as to danger from the suprarenals. Brindeau's patient had a very dark complexion—so very dark that he asked her nationality. She said she had always had this pigmentation. The suprarenal lesions in such cases might be discernible only with the microscope. In one case on record the suprarenal fatality followed a fall, the shock of the trauma alone, without any anesthetic, being sufficient to upset the precarious suprarenal balance. The young girl had been supposedly healthy but both suprarenals were in cheesy degeneration. This was the finding also in the case of an apparently healthy woman who died suddenly a day or so after a normal childbirth; also in a fatality following an operation for an anal fistula. Anesthetics modify the fat in the suprarenals, and when there is reason to suspect suprarenal insufficiency, the operation should be done under local anesthesia. If this is not possible, epinephrin should be given systematically before and after the intervention.

Lyon Médical

July, CXXVI, No. 7, pp. 301-348

36 Experiences with Malaria in Morocco. de Teyssier.—p. 301.
37 *Treatment of Acute Gonorrhea in the Army. Carle.—p. 339.

37. **Treatment of Acute Gonorrhea in the Army.**—Carle relates that his analysis of over 2,000 personal cases converted him four years ago to the superiority of antiseptic over expectant treatment, and his extensive experience since with acute gonorrhea in the army has only confirmed him in this opinion. The large number of men to be treated and the necessity for strict surveillance not to allow men to be detained away from their duties any longer than is strictly necessary, the lack of assistance, and the necessity for using staple drugs, demand a technic that is direct, immediate, intensive, simple, rapid and easy to control. This he accomplishes with an injection of a 25 per thousand solution of potassium permanganate three times a day. Copious rinsing out of the urethra, under the circumstances, invites complications, as the technic and the surveillance are liable to be defective. In about twelve days he commences the irrigation of urethra and bladder with a 10 per thousand solution of the permanganate. At this stage, the irrigations can be entrusted to a trained attendant. This is done in the morning, and at noon and night an injection is given of a 1 per thousand solution of silver nitrate, rapidly increasing the strength to 2 or 3 per thousand. The injection is retained each time for five or six minutes, and this second part of the treatment is kept up for fifteen or twenty days at least. He is convinced that the relapses in two thirds of the cases are due to treatment being discontinued too soon. He mentions a number of minor technical points for the carrying out of the treatment thus outlined.

Paris Médical, Paris

July 14, VII, No. 28, pp. 45-60

38 *Measurement and Record of Joint Impotence. L. Binet.—p. 46.
39 Hypertrophy of Diseased Muscle with Parallel Hypertrophy of Skeleton. H. Claude and J. Lhermitte.—p. 49.
40 *Suprarenal Hemorrhage in Course of Anthrax. H. Roger.—p. 51.
41 Case of Vesiculobullous Dermatitis with Multiple Manifestations in Visible Mucosa. N. Fiessinger and R. Rendu.—p. 54.
42 *Heating Cabinet for the Severely Wounded in Shock. (Projet de "Cellule Chauffante"). H. Feuillade and G. Blechmann.—p. 58.

38. **Measurement and Record of Functional Joint Disability.**—Binet gives illustrated descriptions of a number of devices which permit accurate records of the range of excursions of the knee, shoulder, and other joints. The patient stands in front of a screen or rests the part on a horizontal screen which is marked off with radiating lines representing angles of ten degrees difference. As he raises his arm or flexes his elbow a photograph is taken showing the extreme excursions possible, the extreme range being shown on the same plate, both with passive and active movements. A series of uniform photographs of this kind shows the progress of the case and the outlook.

40. **Suprarenal Hemorrhage in the Course of Anthrax.**—Roger comments on the comparative frequency of involvement of the suprarenals in the camp diseases, including dysentery, malaria and gas gangrene, and reports a case of anthrax septicemia in which cardiovascular disturbances were pronounced from the first. The young man suffered from intense pain in the epigastrium, with profuse vomiting and final hematemesis, evidently due to elimination of the microbes or their toxins by the gastro-intestinal mucosa. The extremely low blood pressure and imperceptible pulse were explained by the necropsy findings of edema of the anterior mediastinum, compressing the pericardium, and destruction of the left suprarenal by a recent hemorrhage.

42. **Hot Cabinet for the Severely Wounded.**—In order to economize time, space and efforts, Feuillade has the men in shock from severe wounds placed in the small operating room connected with a No. 2 Bessonneau tent. The arrangements for heating this small operating room are excellent, and it can be kept very hot and hold four wounded men. The benefit from the heat is remarkable, materially abbreviating the period of shock. In order to give up this room for this purpose, an extra operating room has to be installed in connection with the tent, but during warm weather no heating appliance is required for this. The advantages of this *cellule chauffante* have been demonstrated so conclusively by his experience that the principle will probably be adopted for all the advanced operating posts, he says.

Presse Médicale, Paris

July 12, XXV, No. 39, pp. 401-408

43 *Fourth Disease. (Maladie de Dukes.) A. Lesage.—p. 401.
44 *Specific Action of Tin on Staphylococci. A. Frouin.—p. 402.
45 Streptococcus Associations in Typhus. D. Danielopolu.—p. 403.
46 *Necessity for Supervising the Use of the Foot After Recovery from War Wounds. L. Imbert.—p. 405.

43. **Fourth Disease.**—Lesage replies to those who doubt the existence of Dukes' disease as a separate morbid entity, saying that he has encountered cases of eruptive disease which most certainly were not measles and were not scarlet fever. He describes sixteen features of these cases including the absence of pruritus, of eye and throat disturbances, the incubation of fourteen or fifteen days, and the short duration of the disease, not over a week. Throughout, there was nothing to suggest scarlet fever, except the apparently scarlatinal eruption.

44. **Specific Action of Tin on the Staphylococcus.**—Frouin here reiterates his former statements in regard to the curative action of the salts of tin injected into animals inoculated with staphylococci. It is common knowledge in certain parts of the country that tin-platers never have furuncles. Addition of metallic tin to a culture medium on which *Mycoderma aceti* is growing, does not check the proliferation of the microbe, but there is no further production of acetic acid. These and a number of experimental facts related led him to use a mixture of metallic tin and tin oxid in treatment of staphylococcus infections, and he reports gratifying results even in old rebellious furunculitis. Recent experiences with war wounds infected with staphylococci have shown also encouraging results. The tin was taken internally and the wound dressed with a 5 or 10 per thousand solution of tin protochlorid in water with glycerin.

46. **Reeducation in the Use of the Foot after War Wounds.**—Imbert warns anew that efforts must be made to ward off talipes equinus and other deformity when the men wounded in the legs begin to walk. While the man is confined to bed, the foot may get into a settled deformed attitude although the foot itself was not involved in the war wound. He has seen men with fractured femur which healed perfectly but the

men had to use crutches on account of the talipes equinus that had been allowed to develop and reach a crippling stage. It may not be possible always to avoid it, but it certainly need not be so common nor reach such a stage. Pronounced talipes equinus is worse than amputation, he thinks, as the man is condemned to crutches for good. The use of crutches further aggravates the talipes, and a compensating bending of the knee further cripples the man. Imbert refuses to allow crutches for longer than a week at most. If the man needs them because the fracture is not solid, he belongs in bed a while longer or in a cast. The proper use of the foot will correct the talipes equinus in these cases, and the man must be shown how to use the foot properly. He must be made to take his first steps with the sound foot first. The tendency is always the reverse. By starting out with the sound leg first, the tibiotarsal articulation gradually loosens up. He gets the men to walking as soon as the callus is solid, by two months at latest.

Progrès Médical, Paris

July 7, XXXII, No. 27, pp. 225-232

47 *The Oscillometer in Estimation of Circulation After Obstruction of Arteries. P. Balard.—p. 225. Conclusion.
48 Advantages of Menciére's Iodoform-Balsam Spray Treatment of Wounds During an Offensive Movement. Creignou.—p. 226.
49 Epinephrin Treatment of Hemorrhages and Congestions. A. Satre. —p. 229.

July 14, No. 28, pp. 233-240

50 *Tuberculosis of the Respiratory Apparatus and the War. R. Morichau-Beauchant.—p. 233.
51 *Herpes with Malaria. C. Garin and C.-Descos.—p. 236.

47. **The Oscillometric Index of the Circulation in an Artery.**—Balard expatiates on the value for diagnosis and prognosis of the largest swing of the oscillometer in testing the circulation through an artery. This is the index used for comparison with other arteries, and it is proving very instructive in examining the wounded, especially for estimating the degree of obstruction of an artery in a wounded leg. The oscillometer (Pachon's), he reaffirms, is the ultrasensitive criterion of the persistence or disappearance of the circulation. More than this, with it the development of collateral circulation can be watched and followed, thus permitting judgment as to the efficacy of the different measures applied. This index is further a reliable guide as to the line where amputation can be safely done, comparing the corresponding index on both legs.

50. **Pulmonary Tuberculosis and the War.**—Beauchant says that he has examined 1,206 cases of verified tuberculosis during a recent seven-months' period. This included 258 of a progressive type of the disease and 948 in a stationary phase. He has made a special study of the influence of the campaign on preexisting tuberculous affections, and has been surprised at the satisfactory service rendered by two out of every three with a history before the war of pleurisy with effusion, hemoptysis, bronchitis with emaciation or severe derangement of the general health. Among the 302 in this category, 118 had gone through with their military duties without let-up, and most of them had been at the front from the beginning of hostilities. That is, 39 per cent. had rendered satisfactory service; 25 per cent. had also given good service but had had to drop out for a time once; 24 per cent. had been sent back two or more times, and 28 per cent. had been in the hospital again and again. These satisfactory results were realized with comparatively little damage for the men themselves. In only 10 per cent. the disease had developed into a progressive type. In the others it seemed to tend toward sclerosis, and the possibility of a complete arrest can be considered. The progressing cases were among those who had given the best service, and the flaring-up came late in the campaign. In all others the disease was nearly if not quite stationary, including 161 cases of the fibrous form, fifty-nine of the pleural and forty-eight of the attenuated form.

Primary pleurisy was the most frequent form in which tuberculosis developed apparently for the first time in the soldiers on active service. There were 210 cases of a rapidly progressive type, while the primary fibrous form was observed in 159 cases and the attenuated form in 113. In two cases there was hemoptysis after antityphoid vaccination, and a typical tuberculous pneumonia developed, but the outlook now seems rather inclined to be favorable. In only three cases did the inhalation of drift gas seem to be the starting point for a progressing tuberculosis with bacilli in the sputum. A trauma to the chest is liable to rouse a slumbering tuberculous process. He declares that all soldiers with progressive pulmonary tuberculosis should be sent to a sanatorium or dismissed permanently, and that every recent manifestation of tuberculosis calls for more or less prolonged repose in the home zone. One cannot be too prudent with pleurisy with effusion. To send such patients back to the front after only a month or two of convalescence is liable to entail the wost consequences. He is convinced that many of the men with progressive lesions owe them to their being sent back to the front after too brief interval for convalescence and recuperation. In his experience, pleurisy with effusion seemed the most menacing precursor of progressive pulmonary tuberculosis, and he is tempted to urge temporary discharge from military duties of all such cases. The best plan would be to collect all these pleurisy, hemoptysis and similar cases in special sanatoriums where graduated out-of-door work would aid them in recovering strength and enable them in time to take their place in the ranks again. At present too often the men pass from the hospital straight back into the trenches.

51. **Herpes in Malarial Fever.**—Garin and Descos state that among 246 men with malaria, 121 had herpes and ninety-eight developed it after each malarial attack. All had it more than once. A peculiar feature was that the herpes recurred invariably at the same point, usually the lips, but three times on the ear, five times on the tongue and on the scalp, scrotum, lids and brow, once each.

Correspondenz-Blatt für Schweizer Aerzte, Basel

July 14, XLVII, No. 28, pp. 881-912

52 *Influenza Meningitis. W. Tobler.—p. 881.
53 Research on the Psychology and Physiology of Vision. E. Berger. —p. 892.
54 Psychotherapy for Traumatic Amnesia. (Assoziationsexperiment, freies Assoziieren und Hypnose im Dienst der Hebung einer Amnesie.) H. Rorschach.—p. 898.

52. **Influenza Meningitis.**—Tobler reports a case of meningitis in a 5-months' babe in which the influenza bacillus seemed to be the causal germ. The necropsy findings indicated that the meninges had become infected through the cribriform plate of the ethmoid bone from the nose. The peritoneum had become secondarily involved by way of the blood. The child had been rendered less resistant by inherited syphilis. There was no contagion from this case.

Gazzetta degli Ospedali e delle Cliniche, Milan

June 10, XXXVIII, No. 46, pp. 673-688

55 *Salicylic Ionic Medication for Facial Paralysis. M. Fiorini.—p. 680.
56 *Nervous Symptoms of Vascular Origin. G. B. Queirolo.—p. 682.
57 *Loss of Teeth as Affecting Military Service. E. Villa.—p. 687.

55. **Salicylic Ionic Medication for Facial Paralysis.**—Fiorini refers exclusively to facial paralysis of rheumatismal origin. This yields promptly if treatment is begun during the first week. He applies it by means of a mask, according to Bergonié's technic, sheets of tin foil (*stagno*) being fitted outside a cotton mask modeled over the face with uniform pressure on the side affected. The cotton is impregnated with a hot 3.4 per cent. solution of sodium salicylate. The tin foil electrodes are light and permit uniform pressure. The negative is applied over the ear, the other at the neck. It is very important to protect with rubber tissue any scratches or other solution of continuity on the face. The sittings are from forty-five to twenty minutes long, decreasing the length with increasing current energy. He gives them every second or third day. Little benefit was apparent in his cases until after the third or fourth sitting. The cure was generally complete with from seven to fifteen sittings. A patient with his mask in place is shown in an illustration.

56. **Nervous Disturbances of Vascular Origin.**—Queirolo mentions in particular under this heading the contracture

which develops slowly and progressively without the muscles involved becoming paralyzed. The anatomic basis for the contracture is a diffuse sclerosis of vascular origin affecting the white substance of the spinal cord. The most common form of such disturbances is a paraparesis ranging from slight weakness, with more or less stiffness of the muscles, to severe contracture. The legs may be strong but cannot be used properly on account of tonic contractions, or there may be complete spastic paraplegia. The arms are less frequently affected, but tremor is common. The gravity of the disturbances and their appearance at a comparatively early age, are special features. The tendon reflexes, especially the knee-jerk, become exaggerated early. The responses of the muscles to electric tests are not modified, but there may be less tendency to exhaustion in ergograph tests. Two typical cases are described to show the set of symptoms characteristic of these arteriosclerotic changes in the spinal cord, especially dizziness, disturbances in gait resembling those of locomotor ataxia, pains in the lumbar region, paresthesia of the legs and a sensation as if walking on cotton. There is no tendency to paralysis, the trouble in walking being due to spastic phenomena and incoordination almost complete unless the movements are controlled with the eye. The tendon reflexes are exaggerated, the others normal, the Babinski negative. In one man of 54 there were signs of advanced arteriosclerosis but otherwise conditions were approximately normal. In another man of the same age the gait had gradually become uncertain, incoordinated, spastic, with exaggerated tendon reflexes and negative Babinski, but there was also headache with tremor of the arms, and peripheral arteriosclerosis was marked. The Wassermann test was repeatedly negative. In other cases, vertigo was the predominant symptom although weakness of the legs was pronounced. In one case there was such stiffness of the muscles throughout and especially in the face, that the aspect resembled that of Parkinson's disease. There was no tremor in repose or during voluntary movements, but when gesticulating, a tremor like that of paralysis agitans was evident. In another patient of 59 the tremor gradually became the predominant symptom. He describes other types and transitional forms, emphasizing the differential points that distinguish them from the common affections which they may closely resemble but which differ from them in prognosis and treatment.

57. **Loss of Teeth as Exempting from Military Service.**—Chiavaro, from the standpoint of a dentist, urges that loss of teeth should not cause the rejection of a recruit, as false teeth can remedy this. In France 200,000 men have been rendered fit for duty by providing prostheses. Villa on the other hand reiterates that first class health is a most important element in the making of a good soldier. Men with false teeth who want to escape military duty can break their prosthesis to suit their convenience. He advises rejection of men with extensive caries of the teeth but not of men who have lost their teeth. If they can chew their daily bread with their gums at their homes, they can chew it equally well in camp.

Pediatria, Naples

July, XXV, No. 7, pp. 385-448

58 *Cirrhosis of the Liver, Probably from Inherited Syphilis, in Two Children. O. Cozzolino.—p. 385.
59 *Ascites from Liver-Heart Disease in Child Under Three. C. Martelli.—p. 401.
60 *Physiologic Drop in Weight of the Newly Born. A. Borrino.—p. 413.

58. **Cirrhosis of the Liver in Two Children with Inherited Syphilis.**—Cozzolino had the children long under observation and completed his study of the cases with necropsy. They were girls of 3 and 5 and both presented the typical picture of venous cirrhosis of the liver, with profuse and returning ascites requiring frequent tapping. The Wassermann reaction was faintly positive in only one, and no spirochetes could be detected in the liver of either, although the changes in the liver were typical of syphilis except for the absence of gummatous lesions. There was no marked history of syphilis in either family, but he is confident of the syphilitic origin of the liver trouble, and compares the cases in detail with others in the literature.

59. **Liver-Myocardium Ascitic Syndrome.**—Martelli gives an illustrated description of a case of ascites in a child of 2 which differed in its origin from the usual types of ascitic affections. There was no peripheral edema, and the primary element in the trouble was manifestly the congenitally large and congested liver. This condition was aggravated by weakness of the myocardium, either congenital or acquired from infectious causes, etc. The liver grows more and more congested with obstruction of the portal circulation, and ascites follows from transudation. This clinical picture from lost compensation between the liver and heart may resemble the group of similar affections with polyserositis, but from the etiologic, pathogenic and anatomic standpoints they have little in common. Exact differentiation is important, besides its scientific value, as treatment differs for the two groups. In the group here described, the indications are for means to overcome the congestion of the liver and to strengthen the heart, and reduce the peripheral obstacles to its action. By these means we may be able to tide the patient along until the liver-abdomen plethora can be overcome and conditions right themselves throughout.

60. **The Physiologic Reduction in Weight of the Newly Born.**—Borrino has had the infants weighed systematically at once after birth and again at regular intervals, and tabulates the findings in 1,110 infants at the Turin maternity during three recent years. There was always a physiologic loss, totaling from 100 to 300 gm., reaching its height the second or third day. It has no connection with the form of the feeding or degree of development, but only with the weight of the child. He has become convinced that this loss of weight is due to the great elimination of water from the lungs and skin owing to the changed conditions of existence. The extent of this insensible perspiration and what is lost in the breath upsets temporarily the production and the regulation of heat. In the majority of breast-fed infants the weight rises again the third or fourth day, reaching the birth level by the end of the week in about 50 per cent. With proper physiologic conditions, the child regains its weight at birth during the second week at latest. If this does not occur; if the weight is regained only irregularly or tardily, the physician should be on the alert at once to prevent the child's getting into a state of undernourishment.

Policlinico, Rome

July 15, XXIV, No. 29, pp. 901-924

61 Suggestions for Better Organization of Surgical Service in the Field. R. Alessandri.—p. 901.
62 *Thread or Filiform Drainage in Mastitis. V. A. di Sant' Agnese. —p. 905.
63 Present Status of Reflex Nervous Disturbances. G. Dragotti. —p. 907.
64 *Paraffin-Tar Mixture for Treatment of Burns and Frostbites. A. Paraspori.—p. 912.

July, Medical Section No. 7, pp. 269-308

65 *Lumbar Puncture in Treatment of Essential Headache. G. Mingazzini.—p. 269.
66 Chronic Asphyxia of the Hands Associated with Scleroderma. G. Fumarola.—p. 299.
67 Paradoxic Extension and Flexion of the Hands and Fingers Under Unipolar Faradic Stimulation of the Forearm. C. Pastine. p. 307.

62. **Filiform Drainage in Puerperal Mastitis.**—Di Sant' Agnese has found Chaput's method of draining with thread, wire or a very fine bougie a great improvement over other methods. The thread is drawn entirely through the abscess, using as many threads as needed, and the drainage proceeds incessantly and effectually, the minute openings in sound tissue not filling up, as they are free from dead space, while they do not favor introduction of air, are not painful and do not bleed. Chaput's experience has been extensive and highly favorable with all kinds of lesions, and di Sant' Agnese reports likewise extremely satisfactory results, especially in two cases of mastitis. In the first case he passed silver wire, about 0.5 mm. in diameter, through the entire extent of the abscess and a second wire was introduced later. The dressings were constantly soaked in pus and were changed twice a day. Relief was prompt and healing soon followed, without the damage from an incision, and the woman was able to nurse her child early. The other breast became affected a week or two later, and a bronze wire was passed through the

lesion, with similar prompt recovery. In the first breast an infiltration persisted after suppuration had ceased, and the wire was left in place for nineteen days on this account. In the other breast this persisting infiltration was disregarded, and the wire was withdrawn the ninth day, with equally prompt complete recovery. In the second case he used silkworm gut, and regards this as better for the purpose. An extremely long needle had to be used as the distance through the breast was so great. He used a mattress needle in one case.

64. **Paraffin-Tar Mixture for Dressing Burns and Frostbites.**—Parasporo states that in the thirty cases of this kind in which he has applied a mixture of paraffin and pine tar, all pain subsided at once and the micro-organisms seemed to find the region unfavorable for their proliferation, while the progress of the cases seemed to indicate a mechanical and chemical stimulation of the proliferation of the epithelium. He used paraffin with a melting point at 54 or 57 C., with from 1 to 3 per cent. vegetable tar.

65. **Lumbar Puncture in Treatment of Essential Headache.**—Mingazzini has been applying lumbar puncture in treatment of what he calls persisting hemicrania, the headache keeping up for months and years without interruption or with only brief respite. He excluded all cases suspicious of tuberculosis, syphilis, chronic nephritis, epilepsy and chronic alcohol or tobacco poisoning, and also incipient brain tumors, examining the fundus of the eyes in case of doubt. He also excluded patients with symptoms indicating diffuse pressure on the brain or cerebral neurasthenia. All the patients treated with lumbar puncture have been under observation for months up to two or three years. All but six of the forty-seven patients were women. The spinal fluid always seemed to be normal. A definite cure was realized in twenty-four, about 50 per cent. of the total. Notable improvement followed in fifteen others while no benefit was apparent in eight cases. One woman of 60 had suffered from the headaches from youth and they had become a daily torment during the last six months. She was completely cured by the lumbar puncture, while a woman of 22 whose headaches dated from typhoid two years before was not improved. In the cases showing no benefit, the fluid was always under low pressure while in the improved cases the pressure was almost always above normal. The amount of fluid withdrawn did not seem to influence the outcome, as only 5 or 10 c.c. had been drawn in some of the improved cases while up to 15, 20 or 30 c.c. had been taken in some of the unimproved. Repetition of the puncture did not help when the first did not benefit. The age at the onset of the trouble seems to have great influence as the cured and improved cases dated from the period between the tenth and twentieth years. The unbenefited were those in whom the headache had come on after the age of 20 and it had become permanent during some debilitating illness or lactation or was associated with other neuroses, epilepsy, trigeminal neuralgia or sequels of encephalitis. Another decisive factor was the length of the interval since the headache had passed into a practically continuous phase. The cases in which this phase had lasted a year or more were less tractable. Mingazzini also calls attention to the fact that the headache was aggravated for only from one to four days after the puncture in the cases in which a cure followed. In the others it lasted longer.

Analysis of all his cases has convinced him that the curable hemicrania is the result of loss of normal balance between the glands with an internal secretion during the period of puberty. The functional balance is disturbed, including the mechanism regulating production of cerebrospinal fluid. A vicious circle is set up, the fluid being secreted in abnormal amounts and this keeping the plexus in an irritable state, with exacerbations at periods of hyperemia. By cutting out the factor of the abnormal amount of the fluid, the other conditions are given a chance to right themselves.

Prensa Medica Argentina, Buenos Aires

June 30, IV, No. 3, pp. 25-40

68 Congenital Dental Cysts; Three Cases. O. Copello.—p. 25.
69 Retrocecal Appendicitis Abscesses in Three Children. R. A. Rivarola.—p. 28.
70 *Juxtapapillary Retinochoroiditis. M. I. Puiggari.—p. 30.
71 Pernicious Anemia. J. J. Moyano.—p. 32.

70. **Juxtapapillary Retinochoroiditis.**—Puiggari gives an illustrated description of three cases of the absolute and stationary scotoma of the special type to which E. Jensen called attention in 1908 as corresponding to a small infiltration in the fundus of the eye, close to the papilla. The patients are young people, and the infiltration finally subsides, but it leaves a whitish atrophied area. The Wassermann reaction has always been negative in these patients, and they were healthy, free from any signs of tuberculosis at the time or later. These facts and the benign character of the affection seem to exclude both syphilis and tuberculosis as causal factors.

Revista de Medicina y Cirugia, Havana

July 25, XXII, No. 14, pp. 347-372

72 Extraction of Foreign Body in Bronchus by Low Bronchoscopy. E. F. Soto.—p. 347.
73 Case of Inguinal Cystocele. E. Stincer.—p. 353.

Semana Medica, Buenos Aires

May 31, XXIV, No. 22, pp. 615-642

74 *Vaginal Operations for Suppuration in Tubes and Ovaries. A. Chueco.—p. 618.
75 Pathologic Histology of Muscles in Severe Myopathy. J. C. Navarro and C. A. Correas.—p. 628.
76 History of Public Health Service in Argentina. E. R. Coni.—p. 631. Continuation.
77 Quantitative Determination of Oxidases and the Oxidasogenous Unit. L. Goldemberg.—p. 640.

74. **The Vaginal Route for Operations on Suppurating Tubes and Ovaries.**—Chueco is chief of the operative gynecologic department of a Buenos Aires hospital, and he pleads for the more general use of the vaginal route in removing pus tubes and ovaries in suitable cases. The adnexa must be capable of being reduced and brought out to the surface, and this can be determined beforehand. When conditions permit of the vaginal route, the advantages are overwhelming, not the least being that the lesion is attacked logically, from the most virulent focus first, working upward to the sound intestines, while by the laparotomy route, the sound parts have to be entered first and the operator works down to the most virulent region. Another advantage of the vaginal route is that—the abdominal walls not being incised—there is no special stiffening or retraction of the walls, squeezing parts below and fostering adhesions. All this is obviated by the vaginal route, and when this simple and harmless surgical intervention is supplemented by serum and vaccine therapy, we come near to realizing the ideal for the patient. It is far from ideal for the operator, however, as it is much easier for him to work through an abdominal incision. The patient gains however immeasurably, and with practice the vaginal operator soon finds himself master of the technic. The greatest difficulty is hemostasis, but that this can be mastered is evident from the mortality of zero per cent. and zero per thousand in comparison with the 6 or 8 per cent. mortality in laparotomies for virulent suppurating processes in the adnexa. Working from below, the wall of new tissue, which Nature has thrown up to protect the peritoneum from the lesions below, can be left unmolested. In his hundreds of cases there was never a trace of peritonitis, even when the pyosalpinx was so large that it had to be punctured to evacuate some of the contents before it could be "exteriorized." He does not try to remove with the adnexa the wall of new tissues above; these are soon absorbed after the source of the irritation has been taken out. He uses silk in ligating, leaving the ends long to project from the vulva. This aids in draining and allows the silk to be pulled out when no longer needed. When clamps are used, he leaves them for five days, renewing the gauze around them every day.

Siglo Medico, Madrid

July 14, LXIV, No. 3318, pp. 505-524

78 Nontuberculous Suppuration in the Kidneys. S. P. Pascual.—p. 506. To be continued.
79 *Insufficiency of the Kidneys in Connection with Hemoptysis. Pasanis.—p. 508.

80 Difficulties in Treating Syphilis of the Nervous System. Sicilia. —p. 510.
81 Present Status of Dietetic Treatment of Diabetes. N. Santos—p. 520. Commenced in No. 3316, p. 479.

79. **Hemoptysis from Insufficiency of the Kidneys.**—Pasanis' patient was a robust farmer of 36 who had been healthy until a year before, when he had had what seemed to be an acute nephritis for three weeks and during convalescence there was a profuse hemoptysis. He was put on a special diet and his life regulated as for treatment of pulmonary tuberculosis, the assumed cause of his hemoptysis, but notwithstanding the greatest care the hemoptysis returned a month later. He was then sent to Pasanis for more exact differentiation, but the latter could find nothing to justify the assumption of tuberculosis. Hemorrhages in the course of nephritis are not so very uncommon, and although the urine seemed to be normal at the time of his examination he assumed a renal basis for the hemoptysis. Consequently he placed the patient on an antinephritic diet and regulated his life to spare the kidneys, prescribing merely calcium chlorid, 0.25 gm. a day, fractioned. The patient has been in excellent health during the four years since to date, with no further suggestion of hemoptysis.

Grèce Médicale, Athens

XIX, No. 5-6, pp. 9-12

82 *Pathogenesis of Paralysis Agitans. (Maladie de Parkinson.) C. T. Manthos.—p. 9.
83 *Examining the Iris with Strong Light Brings on Epileptic Seizure. C. T. Manthos.—p. 10.

82. **Paralysis Agitans.**—Manthos remarks that recent experiences and deductions have apparently demonstrated that the normal parathyroids are regulators of neuromuscular functioning. Roussy and Alguier found the parathyroids pathologic in several cases of paralysis agitans, and Manthos reports that the parathyroids were much enlarged in a case of typical Parkinson's disease in a woman of 55.

83. **Provocative Test for Epilepsy.**—Manthos was examining the eye of a medical student subject to epileptic seizures about once in three months. As the powerful reflected light fell on the retina, a typical epileptic seizure followed immediately. The irritation of the retina from the light probably brought on the seizure.

Russkiy Vrach, Petrograd

XVI, No. 11, pp. 241-264

84 Gas Gangrene. N. M. Volkovitch.—p. 241.
85 Treatment of Wounds of the Spinal Cord. V. E. Dzerzhinsky. —p. 247.
86 *Muscle Plastic Operations After Wounds of the Face. A. M. Nikolsky.—p. 252.
87 *War Wounds of the Skull and Its Contents. S. I. Liukomovitch. p. 254. Conclusion.

86. **Muscle Plastic Reconstruction of the Face after War Wounds.**—In the case described and illustrated, the temporal muscle was used to pad the disfiguring depression in the cheek.

87. **Wounds of the Skull.**—Liukumovitch concludes his long analysis of a year's experience with wounds of the skull and brain with a number of recommendations. He denounces as absolutely disastrous any attempt to send back from the front those who have been recently operated on for a skull wound. The danger with a skull wound is from infection much more than from the seriousness of the traumatic injury if it does not prove immediately fatal.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

June 9, I, No. 23, pp. 1859-1922

88 *Mortality from Tuberculosis During Mobilization Period in the Netherlands. B. H. Sajet.—p. 1860.
89 *Blue Sclerotics in Connection with Other Anomalies. N. Voorhoeve.—p. 1873.
90 Case of Autochthonous Lepra. J. Broers.—p. 1881.
91 Medical Impressions of America. C. W. F. Winckel.—p. 1896. Continuation.

88. **Tuberculosis Mortality During the War.**—Although Holland is not involved in the war, yet its military forces have been mobilized throughout, and Sajet's statistics show that the mortality from tuberculosis has increased in the cities from 154.4 per hundred thousand inhabitants in 1913 to 179.5 in 1916. Even a stationary mortality is equivalent to decided loss as the tuberculosis mortality had previously shown a steady decline for a number of years. The call to the colors has brought dozens of young men, who had been getting scarcely any exercise in their lives, into conditions calling for much exercise, and while this is a benefit for many, in others, and especially those with latent tuberculosis, it may lead to the flaring up of the disease. The mortality from tuberculosis has not increased materially among young men in the cities, but it has shown a great increase among the women between 20 and 30, at least in the working classes. He ascribes this directly to the higher cost of living and consequent insufficient food while the man of the family is absent with the troops. The mother keeps the poorest and the smallest portions of the food for herself, giving the best to feed the children. There is also much unemployment. He says that the measures to repress the spread of tuberculosis have hitherto been altogether too dilettante. Much has been done, but it is still, "Oh, so far from complete!" Money is raised by flower-tag days, but only enough to send a few patients to the sanatoriums, and nothing can be done for the hundreds of others who need it. The tuberculous wage-earner has to keep at work to support his family; the tuberculous mother of the family toils to keep the husband and children fed and clothed. The increasing mortality shows that the number of sources of infection for tuberculosis is constantly growing larger. The campaign against it should no longer be left to private initiative, he declares.

89. **Familial Blue Sclerotics and Other Anomalies.**—Voorhoeve describes a family of father and two daughters who had multiple fractures of different bones, blue sclerotics and other anomalies, and the man was able to supply data in regard to several generations of his family showing that these anomalies were inherited. Voorhoeve gives the family tree of one branch of the family, containing fifty-nine members, forty of whom he was able to examine personally. The total data include 244 members of the family, through several generations. It is possible to trace through these generations the evolution of the defects which culminate in the fragility of the bones, the blue sclerotics and other anomalies in the mesenchyma organs. Hemophilia was the first anomaly of which there is record in the family. The inferiority of the blood and blood vessels was not manifested in the hemophilia alone, but congenital heart defects were comparatively common. The bones did not display any tendency to fracture in the early generations, but cleft palate and rachischisis showed that the skeleton was abnormal. Blue sclerotics were noticeable in the early as well as the late generations. The whole family history indicates as the explanation of the anomalies an inherited inferiority of the mesenchyma. In four members of the last generation examined, labyrinthine deafness was pronounced. This seems to conflict with the mesenchyma theory unless we assume that the organ of Corti was affected only secondarily to some anomaly in the stria vascularis which is of mesenchymal origin. In any event, he thinks that this assumption of inferiority of one of the great differentiated groups into which the embryonal cells develop, gives a good working hypothesis, and renders particularly interesting and perhaps important the collection of hereditary data along these lines, bearing the diverging lines of embryonal development in mind.

Norsk Magazin for Laegevidenskaben, Christiania

July, LXXVIII, No. 7, pp. 769-888

92 *Acute Leukemia. K. Nicolaysen.—p. 769.
93 *The Venous Murmur. K. Utheim.—p. 802.
94 *Free Graft from Peritoneum to Close Perforated Gastric Ulcer. A. Raabe.—p. 814.
95 *Progressive Bulbar Paralysis and Spinal Atrophy Consecutive to Poliomyelitis. L. Sommerfelt.—p. 823.
96 *Retropharyngeal Pituitary Tumor. F. Leegaard.—p. 829.
97 *Progressive Multiple Ossifying Myositis. C. Johannessen.—p. 839.

92. **Acute Leukemia.**—Nicolaysen analyzes three recent cases of acute leukemia in his experience. One was in a boy of 15 and developed after a diphtheria-like throat affection.

The boy had been previously healthy except for pneumonia at one time and a fractured leg. After a brief period of a hemorrhagic tendency, suggesting scurvy, severe anemia followed with enlargement of the spleen—the blood typical of myelogenous leukemia—fatal in a month or two after the first sign of trouble. Fully 33 per cent. of all the nucleated blood corpuscles were megaloblasts and normoblasts. Holst found streptococcus infection in three cases of acute leukemia, and Harbitz the staphylococcus and the pyocyaneus in two cases respectively. The second case here described was in a previously healthy young woman; the hemorrhagic tendency developed acutely in the course of a suppurative process in the jaw, with progressive anemia and death the third month. In neither of these cases could any germ be cultivated from the blood. Both developed during the month of April, 1916. Roentgen exposures were applied without benefit in the second case. The third patient was a boy of 17 who entered the hospital six months later than the others. He had been previously robust and said he had never been sick except for a briefly transient period of "poor blood" for which he had taken iron, the summer before. He died five days after he entered the hospital with the diagnosis of leukemia. The first symptoms, pallor and lassitude, had been noticed less than a month before. The glands soon became enlarged and the blood findings typical of acute lymphatic leukemia. Dyspnea, somnolency, edema, polydipsia and polyuria were marked symptoms toward the last. The pituitary body was found of normal size and shape, and the spleen was not so large as in the other cases, while the glands and the thymus were much larger. This seems to be a differentiating point for lymphatic leukemia, as also the protrusion of the eyeballs and the restriction of the hemorrhagic tendency to the intracranial region. A gram-positive diplococcus was found in all the organ sections but the blood was not examined during life. Nicolaysen thinks there need be no difficulty in distinguishing between acute myelogenous and acute lymphatic leukemia, as the clinical picture differs and the Pappenheim stain shows such differences in the blood picture, as he illustrates with colored plates. The indol-phenol reaction is not very reliable, and is of use only in dubious cases. This is based on the blue reaction when a solution of dimethylparaphenylendiamin and a solution of alpha naphthol act on the protoplasm in cells of myelogenous origin (W. H. Schultze).

93. **Venous Murmur.**—Utheim refers to the sound heard on auscultation of the triangular fossa between the sternal and the clavicular attachments of the sternocleidomastoid muscle. Laennec called it the song of the arteries. Utheim explains the mechanism for the sound, and states that it is practically constant in children under 10 but grows less frequent with advancing age. It does not seem to have any connection with anemia.

94. **Gastric Ulcer Perforation Patched with Flap from Peritoneum.**—Raabe's patient was a man of 45 with stomach disturbance for about three years when symptoms of perforation compelled operative treatment. The perforation was quite large, in the middle of the lesser curvature, and as the omentum was too short to draw up over it, he covered the opening with a piece, 4 by 4 cm., cut from the reflection of the peritoneum between the falciform ligament and the parietal peritoneum. The edges of the perforation were freshened with phenol and the vicinity painted with iodin, and the flap was sutured as solidly as possible over the opening. For three weeks the man was fed exclusively with nutrient enemas, an evacuating enema being given daily after the fourth day. The patient thrived remarkably and by the sixth week could eat ordinary food.

95. **Poliomyelitis with Bulbar Paralysis.**—Sommerfelt here gives the necropsy findings in one of the cases published by him last year and summarized in these columns June 23, 1917, p. 1952. Nothing was found to throw light on the combination of progressive bulbar paralysis and progressive spinal muscular atrophy in the man who at one time had had poliomyelitis.

96. **Tumor of Pituitary Tissue in the Retropharynx.**—Leegaard's patient was a workman of 23, mostly healthy, until in 1912 he began to cough and experience difficulty in swallowing, with pains in the throat and difficulty in breathing. The large retropharyngeal tumor was easily removed in several pieces, without bleeding. It was evidently a pituitary adenoma, growing from the anterior lobe of the pituitary body, the pharynx hypophysis, as it is called. But there were no symptoms at any time suggesting any anomaly in pituitary functioning. This confirms the general assumption that the pharynx hypophysis does not possess a physiologic function.

97. **Multiple Progressive Ossifying Myositis.**—Johannessen gives an illustrated description of a case of this rare affection in an apparently well developed child of 2 with normal mucosa but a discharge from both ears. She screams if she is touched, but otherwise sits quietly, the head bent forward, watching with interest what goes on around but following objects only with her eyes, not moving her head. She presents a typical example of this affection which usually commences with edema and tenderness of certain muscles, with slight fever. Then follows a more solid infiltration and finally bone formation. The infiltrations skip about abruptly from one muscle group to another, and the temperature shows little change. There do not seem to be any data on record as to the length of the interval between the infiltration and the bone formation, but in this case there was tumefaction in the superior serratus in November, 1916, and by the following January the Roentgen rays disclosed bone tissue in the muscle at this point. In one case on record the disease progressed after a pause of twenty-three years. In the only case of the kind reported in Norwegian literature, the trouble began at the age of 2 and the girl died suddenly about 12. She had been unable to feed herself for years, as she could not move her arms, but was able to take a few steps and could read and sing although she had never been able to go to school. The various theories that have been advanced to explain this affection ascribe it to a bony diathesis, a trophoneurosis, inflammatory processes in the muscles or defective differentiation of the mesenchyma. This latter assumption is sustained to a certain extent by the almost invariably accompanying microdactylia. The latest and most comprehensive study of the affection was published by Goto in 1913, who repeatedly examined scraps of tissue from a boy of 4 as he grew up with the affection. In Johannessen's case, potassium iodid, thyroid treatment and other measures were systematically applied, but no benefit is mentioned. The child had a good appetite and slept well, with the natural functions in good order, but she fell when she tried to get about, and the part bruised would swell up instantaneously as large as half an apple.

Ugeskrift for Læger, Copenhagen

June 21, LXXIX, No. 25, pp. 997-1038

98 *Lumbar Puncture Fluid Constantly Sterile with Severe Otogenous Meningitis. G. V. T. Borries.—p. 997.
99 Sulphur in Treatment of Scabies. (Erfaringer over Fnatbehandling med Ung. hepatis sulphuris.) Ehlers.—p. 1005.
100 Present Status of the War Bread Question. V. Scheel.—p. 1008.

98. **Sterile Lumbar Puncture Fluid with Otogenous Meningitis.**—Borries discusses how it is possible for otogenous meningitis to develop and run its course to a fatal termination with the cerebrospinal fluid sterile throughout. He tabulates the findings in eight such cases. The infection occurred by way of the tympanum and mastoid bone in nearly all; in only one was it traceable to the labyrinth. But in all there was an abscess or sinus phlebitis, subdural suppuration. It is evident that purulent internal pachymeningitis may induce meningitis with which the cerebrospinal fluid may be constantly sterile and approximately normal otherwise, confirming the possible mildness of otogenous meningitis. The danger lies in the concomitant purulent internal pachymeningitis. To be fully instructive, lumbar puncture must be repeated often as the findings are liable to veer from positive to negative and vice versa at any time. Finding the fluid sterile when symptoms of meningitis are pronounced should warn to seek for purulent pachymeningitis or circumscribed suppuration and thus it gives the clue for diagnosis and treatment.